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—
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"Happy, truly, is the naturalist. He has no time for melancholy dreams. The earth becomes to him transparent; everywhere he sees significancies, harmonies, laws, chains of cause and effect endlessly interlinked, which draw him out of the narrow sphere of self-interest and self-pleasing, into a pure and wholesome region of solemn joy and wonder."—CHARLES KINGSLEY in '*Glaucus*.'

"The perfect naturalist should have in him the very essence of true chivalry, self-devotion; the desire to advance not himself and his own fame or wealth, but knowledge and mankind. . . . The spirit which gives freely, because it knows that it has received freely; which communicates knowledge without hope of reward, without jealousy and mean rivalry, to fellow-students and to the world."—CHARLES KINGSLEY.

"And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything."

'*As You Like It*,' Act ii., Scene 1.

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[No. 200.]

NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. SPILLER.

NATAL, the "Garden of South Africa," is far more abundantly supplied with butterflies than any other part of British South Africa. Many species, such as *Junonia Natalica*, *Salamis Anacardii*, *Acræa Petræa*, *Eronia Leda*, *Papilio Policenes*, &c., are found in abundance along the coast district, and occur nowhere else south of the tropic of Capricorn. The climate in the lowlands adjoining the sea is quite tropical, and butterflies are to be found every fine day throughout the year; in fact, even in the depth of our "winter" more species are to be obtained than in the middle of summer at home. Trimen, in his work on the Rhopalocera of South Africa, enumerates 222 species as inhabitants of the country south of the tropic of Capricorn; but the list is evidently incomplete, since I have taken several new species myself.* In Natal I believe at least 200 kinds occur, many of them very beautiful, although, of course, their splendour cannot equal the beauty of the magnificent denizens of the Amazon.

The best months for butterflies are March and April, and then the country is all alive with insect beauty. Several species remind one forcibly of England. Thus *Papilio Demoleus* bears a superficial resemblance to *P. Machaon*; *Pieris Agathina* to *Pieris brassicæ*; *P. Pigea* to *P. rapæ*; *P. Hellica* to *P. Daphidice* and the American *P. Protodice*; *Colias electra* to *C. edusa*. Several of the *Acræas*, on the wing, closely resemble the smaller Fritillaries, such as *Argynnis Euphrosyne* and *Melitæa Artemis*; and amongst the Skippers, *Pyrgus Vindex*, *Pamphila Pontieri*, and *P. Havei*, correspond respectively to *P. Alveolus*, *Hesperia Comma*, and *H. Linea*. Three European species occur plentifully, viz., *Danaus Chrysippus*, *Lycanæa Bætica*, and *Pyrameis Cardui*.

* A great number of additional species have been recorded by Trimen and others since the publication of his work.—ED.

Twelve species of the genus *Papilio* occur. *Merope*, a straw-coloured species banded with black, occurs sparingly, and seems to be commoner in Cape Colony than here. It is a "bush" butterfly; all the specimens I have met with have been taken in the deep recesses of the forests. The splendid green and black *P. Polices* is abundant around the bay of Port Natal. It flies with great rapidity, but is easily captured when settled on damp ground. On New Year's Day, 1879, I took a very fine series in this manner in woods at Umgeni, about four miles from Durban. It had rained heavily during the night, and going next morning to their haunts I was rewarded by taking several dozens of this species, as they drank the moisture from the damp ground. Another black and green swallow-tail is *P. Nireus*, which is common everywhere; its abundance, however, is surpassed by *P. Demoleus*, which is as plentiful as *Pieris rapæ* at home. A species called *Pap. Pylades*, but which is rather different from the normal type, is very plentiful at Durban and *Leonidas*, is also abundant; but my greatest prizes amongst this family have been *P. Zenobius* and *P. Cenea*, the former a large black and white insect, and the latter a fine black butterfly, with yellow-ochreous spots. This latter species is most plentiful in April, and delights to sun itself on the dark green leaves of the orange tree. The largest swallow-tail, *P. Ophidocephalus*, was first taken in Kaffraria by Mr. Bowker, an enthusiastic entomologist of Natal. This species expands about five or six inches, and is not unlike an exaggerated gigantic *P. Machaon*. It occurs at the Inanda, about eleven miles from here, and appears in the beginning of the year; but I have not been successful yet in taking it, for exactly at the time I planned an expedition there, the dreadful disaster of Isandhlwana occurred, the effect of which was to send all the country residents flocking to the towns for protection from threatened Zulu raids. When confidence had in some measure been restored, and the residents at the Inanda returned to their farms, I rode to the locality, and remained there several days seeking it, but, unfortunately, without success. However, I was successful in capturing a fine new species of the genus *Debis*, a new *Nymphalis*, and saw a new species of the genus *Atella*, which in my eagerness I failed to catch.

The "whites" are not well represented here. *Pieris Agathina*, *P. Pigea*, *P. Severina*, and *P. Gidica* are all abundant, but *P. Mesentina*, *P. Calypso*, and *P. Hellica*, I take but sparingly.

One of the most interesting genera of South African butterflies is the genus *Anthocharis*. Eighteen species are recorded by Trimen, but it is, I think, fairly questionable whether some of these are not merely summer and winter forms of the same species. Thus *A. Evarne* and *Keiskamma* are generally given as two distinct species;* but, after a most careful investigation of these so-called species, I am convinced they are simply summer and winter forms of the same. In summer they are all *Evarne*, in winter all *Keiskamma*; the same bushes that produce *Evarne* in summer, harbour *Keiskamma* in winter. *Evarne* is darker on the upper surface and lighter beneath than *Keiskamma*. Their ground colour is sulphur-yellow, with orange apical blotches. Many of the South African *Anthocharis* have brilliant orange-red apical blotches, and are marked in summer with deep black bars. Now in winter the same species occur, but they have, in ninety-nine cases out of a hundred, lost their black bars, and are plain white, with orange-red blotches at the apices of the wings. A very handsome purple-tipped species is *A. Ione*; it is plentiful near Durban, and occurs, I am told, far up in the Transvaal.

Four species of the genus *Eronia* are found in Natal; two of them, *E. Leda* and *E. Cleodora*, are abundant; the others are scarce; *E. Leda* is a large sulphur-coloured butterfly, with orange tips; *E. Cleodora* is yellowish white, with black margins to all the wings. These are swift flyers, but *E. Leda* is not a difficult butterfly to catch; its large size and brilliant colours render it a sure mark directly it comes within the sweep of the net. Both species are particularly fond of river-courses, especially when these are nearly dry, and their sides covered with sloping brushwood.

The genus *Callidryas*, as entomologists well know, is essentially a tropical one; hence only two species occur in Natal, and these are found in the middle of summer. The white *C. Florella*, whose range extends from Kaffraria to Egypt, is the commoner; it is fond of settling on flowers at the edge of forest lands. The yellow *C. Rhadia* I have seen but twice, and then the amazing rapidity of its flight rendered pursuit hopeless.

Colias Electra is a very plentiful insect; it is almost identical with *C. Edusa*, and like it, has a white variety of the female. At Cape Town, on Nov. 29th, 1878, I found this the commonest butterfly; it occurred by hundreds on Table Mountain and the

* Mr. Kirby, in his catalogue of the Diurni, places both these as one species.—Ed.

Lion's Head; a species of *Erebia* (*E. Hyperbius*) and *Leptoneura Cassus* also flew there.

I have taken four of the genus *Terias* in the colony, they all seem tolerably numerous near here. The species are *T. Rahel*, var. *Desjardinsii*, *Brigitta*, and *Pulchella*.

Three species of the genus *Danaus* inhabit the colony; the most abundant being *D. Chrysippus*, which is to be seen all the year, and to be met with in all kinds of localities, gardens, fields, hillsides, and forests. Some of the *Acræas* mimic this species, and so perfect is the resemblance on the wing that many female *Acræas* look exactly like very small specimens of *D. Chrysippus*. The female of *Diadema Misippus*, however, is the most perfect mimic of the species in question that I have ever seen. It is exactly the same size, the ground colour in most instances the same, in others slightly lighter, and it possesses the white spots near the apices of the fore-wings, as in *D. Chrysippus*. A very rare variety of *D. Chrysippus* is occasionally found without the customary white apical spots (var. *Dorippus*), and to make the mimicry perfect there is a similar variety of the female *D. Misippus*. The male of *D. Misippus* is utterly different, being a rich black, with, in good specimens, a suffusion of purple, and with a purplish violet spot in each wing. Specimens of *D. Chrysippus* are met with in the middle of summer that possess partially white hind wings; in one instance I met with a specimen identical with the West African form, *Alcippus*. Another *Danaus*, *D. Echeria*, is very plentiful in woods, and flies with a very graceful flight, very much like *Limenitis Sipylla* at home. The third species, *D. Ochlea* (a black and white species), is tolerably plentiful, but in my cabinets I find it represented by about twenty specimens, all that I have managed to secure in this part of the colony.

The *Acræas* are a peculiar African family of butterflies; they have long and narrow fore wings, and most of their females mimic *Danaus Chrysippus*. *A. Horta*, though plentiful at Cape Town, is not abundant on the Natal coast; but in the elevated lands, twenty miles inland, I have taken it. It has a more lofty flight than the others of this family. *A. Dice* (*Querina*) I have taken twice; it seems very rare. *A. Zetes* is also a scarce insect, and the same remark applies to *A. Aganice*, which latter insect is the largest of the family. *A. Violarum* is plentiful at Durban and along the coast to the Tugela; it is of a brick-red colour, suffused with orange. *A. Nohara* is a rather local species; its colour is fulvous-yellow, and

it is a rapid flyer. *A. Hypatia* (*Natalica*) is tolerably plentiful, and the beautiful *A. Petræa* is very plentiful. It is of a brick-red colour, spotted with black in the male, whilst in the female I possess every possible variety betwixt brick-red and absolute black. *A. Rahira* is abundant at Durban on land that is now being built upon. *A. Lycia* is common in grassy places; *A. Serena*, *Cynthia* (*Eponina*), and *Protea* (*Esebria*) are also common; whilst the two most singular members of the family are, in my estimation, *Acraea Punctatissima* and *Alana Amazoula*. The former is a rather rare species, its expanse of wing an inch and a half, its colour ochreous-yellow, spotted like a leopard; on the four wings I count 114 spots. The singularity of this butterfly has induced me to scour the country for miles round Verulam for it, but after eight months' collecting I only observe fifteen specimens in my collection. *A. Amazoula* has generally been considered a great rarity; it is, I find, very local, haunting broken ground and settling on the tall grass. The evening is the best time for its capture, as the butterflies may then be easily taken as they rest (*in cop.*) on the grass-stems. Its habits during sunshine resemble the *Hesperidæ* rather than the *Acraeinæ*, and a "beginner" would naturally place it amongst the Skippers. I only know two localities for it; in each case the insect is restricted to a small patch of ground, although the surrounding country seems equally suitable and similar, but in these localities it is so plentiful that I find I have taken 200 fine specimens, and there is not the least apparent diminution in their number.

The Asiatic and African *Atella Phalanta* is pretty common everywhere; on the wing it exactly resembles a Fritillary. *Pyrameis Cardui* is plentiful, of course; colonists here name it the "Sand-butterfly." Another species, probably *Hypanartia Hippomene*, resembles a small *P. Atalanta* with tails; it is scarce; the only specimen I ever saw was resting on a hut in a Kaffir location.

(To be continued.)

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. KIRBY.

No. XV. NYMPHALIDÆ—NYMPHALINÆ.

(CYRESTIS to VICTORINA.)

THE genus *Cyrestis* includes a number of delicate species confined to Tropical Asia and Africa. The smallest species

expand rather under one inch and a half, but the majority expand from two to two and a half inches. The shape of the hind wings is peculiar, as they are generally produced into a lobe at the anal angle, and there is a short projection or tail at the lower part of the hind margin, where the wing is angulated. Many of the species are white, frequently more or less bordered with brown. The border is generally marked with tawny at the anal angles, and sometimes with a more or less distinct row of black spots in pale rings. Towards the base the white species are marked with very delicate transverse lines, or with double black lines, filled up with brown, or (in the African species) with pale yellow. Another group of the genus is tawny, with single or double transverse brown lines (in the latter case filled up with the ground colour); and a third group is dark brown, with paler transverse lines towards the base, a submarginal row of eyes, and a tawny spot at the anal angle of the hind wings. Across the centre of the wings is a transverse band of white, varying in width.

This genus is represented in South America by the genus *Megalura*. These are more robust insects, and might be mistaken for *Papilios* but for their undeveloped front legs, as there is a long tail at the lower part of the hind margin of the hind wings, and a lobe at the anal angle, which in some species is also greatly produced. Most of the species are of some shade of dark brown, or tawny, with slender dark lines running from the costa across both wings: some, however, are tawny, with broad dark margins, and the basal half of the hind wings blue. One species, *M. Harmonia*, Klug, is yellowish white, with slender lines. *M. Peleus* and *Eleucha* are long-winged tawny species, with transverse black lines, and have three tails on the hind wings, that in the centre being the longest. The typical group expand about two inches and a half; the long-winged species are larger.

The genus *Victorina* likewise consists entirely of South American species. They are rather large insects, with dentated hind wings, the middle tooth projecting into a short tail. One of the commonest species is *V. Steneles* (three or four inches in expanse), which has a superficial resemblance to *Colanis Dido*, being brown, with a broad greenish central band on the hind wings, which is broken into large spots in the fore wings, and there is an outer row of green spots, preceded by a red spot or

orange spot placed at the anal angle of the hind wings. A smaller species, *V. Sulpitia* (about two inches in expanse), is brown, with a common greenish white band divided on the fore wings, beyond which, on the hind wings, is a more or less distinct tawny stripe. The upper side resembles that of *Pyrrhogyra*, but the under side is more like that of some species of *Adelpha*, being transversely banded with dull white, black and tawny. *V. Epaphus* is a larger insect (three inches in expanse), brown, with a white stripe running from the middle of the costa of the fore wings to the root of the tail. The outer portion of the fore wings is tawny. *V. Trayja* closely resembles this, but the outer part of the fore wings is brown. The Mexican and Central American *V. Superba* may be known by the white band being bluish on the edges; the fore wings beyond it are brown, with a slight tawny shade, and their hind margin is more emarginate than in any other species of the genus.

[The next paper will be devoted to *Hypolimnias* and other Old World genera. I regret that in consequence of my transfer from the Dublin Museum to the British Museum I was obliged to discontinue my papers in the 'Entomologist' for a time. I hope now to be able to continue them at intervals, though perhaps not quite regularly at present.—W. F. K.]

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By WALTER P. WESTON.

(Continued from vol. xii., p. 220.)

Ptycholoma Lecheana, Linn.—Common everywhere among oaks (*Quercus robur*) and elms (*Ulmus campestris*), in the rolled-up leaves of which the larva feeds; the imago flies very freely and boldly towards dusk, when it is often rather a pest than otherwise.

Ditula Hartmanniana, Linn.—A local species, but not uncommon where it occurs. The imago is to be found at rest on the trunks of willow trees, but it is not easy to box, as it runs quickly up the stem, keeping in the crevices of the bark, and when clear of the box flies to the topmost branches. In Kent it has occurred at Lewisham, New Cross, and near Gravesend; while the Surrey localities are Surbiton, Weybridge, and near Hammersmith. It

may be expected to be met with all down the Valley of the Thames, wherever willows occur..

D. semifasciana, Haw.—Widely distributed among willows, but not abundant. The larvæ feed in united shoots of willow in May and June, generally preferring dwarf and stunted bushes, and the imago appears in July. It does not fly freely till nearly dark, when it can be easily taken by the aid of a lantern, flying from shoot to shoot, or at rest on the leaves. It also comes to sugar.

Penthina corticana, Hub., *picana*, Fro.—Widely distributed. The larvæ may be found in May and the early part of June, feeding on birch (*Betula alba*) and on some of the willows. The imago appears in June and July, and should be looked for at dusk, flying round the trees, or it may readily be disturbed by beating. It may be distinguished from the following species by its having large patches of white in the basal portion of the fore wings, which sometimes are united and occupy the whole of the basal portion of the wings, separated by a broad, irregular band of black from the white apical patch. This extreme form is, however, of great rarity.

P. betulatana, Haw.—Much commoner than the preceding species, which it much resembles in general appearance.

L. caprea, Hub.—Local, but distributed. This species may be reared from collected shoots of willow in May and June, which should be kept in a flower-pot, in a cool and airy place. The imago appears in July, and may be obtained by netting at dusk, and also by beating. It is more common among willows in hedgerows, and this season (1879) was unusually abundant. It is recorded from West Wickham and Croydon in Surrey; Haslemere, Tilgate, Lewes, and Hastings, in Sussex; and in Kent at Darenth, Strood, and Tunbridge Wells.

P. sororculana, Zett. = *prælongana*, Gn.—Distributed throughout, but not common in the South of England. I have found this species scarcer in these counties than the preceding one. The larva is said to feed in the autumn on birch; the imago is certainly to be taken in May, amongst birch trees.

P. pruniana, Hub.—Common everywhere, and most abundant by whitethorn hedges.

P. ochroleucana, Hub.—Widely distributed, and not uncommon among roses, especially the cultivated sorts, in gardens. It is

best when bred. The larva feeds in May, and the moth appears the following month.

P. cynosbana, Linn.—Abundant everywhere.

P. dimidiata, Treit. Sod.,=*ochromelana*, Gn.—Local. The Rev. E. N. Bloomfield records its occurrence sparingly at Hastings.

P. sauciana, Hub.—Local. In Kent, it occurs near Sevenoaks and Tunbridge Wells; in Surrey, at Leith Hill; and at Haslemere, in Sussex.

P. gentianana, Curt.—Common throughout among teasel (*Dipsacus sylvestris*), in the seed-heads of which the larva feeds. These heads should be gathered in March or April, and put into bandboxes. The moths will emerge in July or August without further trouble.

P. sellana, Hub.—Distributed, but not abundant. The imago frequents grassy places with mixed herbage, broken ground, &c., and is particularly partial to railway slopes. It is an insignificant insect in appearance, and is not readily to be distinguished when on the wing from the *Dicroramphæ*. It is to be taken in May and June, and sometimes in July; but whether there are two broods or one straggling one is open to question.

P. oblongana, Haw.,=*marginana*, Haw.,=*similana*, Wilk.—Distributed throughout, but local, and it appears to be more of a woodland species than the preceding; its capture has been recorded from Folkestone, Dover, Tunbridge Wells, and Strood; Haslemere, and Croydon.

P. fuligana, Hub.,=*ustulana*, Haw.,=*carbonana*, Db.—Much scarcer than the last species, but it appears to be nearly as widely distributed, specimens having been captured at Tilgate Forest, Coombe and Darenth Woods, Folkestone, and Hastings.

(To be continued.)

MICRO-LEPIDOPTERA NEW TO THE BRITISH LIST.

By J. B. HODGKINSON.

TRIFURCULA PALLIDELLA, Zell.

DURING the fourth week in August last, when sweeping for *Phygadeuon* in the neighbourhood of my country house at Dutton, near Ribchester, I netted a small pale yellow moth,

which at first sight I took to be a dwarf specimen of *Elachista subochreella*. It temporarily escaped from my net, when I noticed that its mode of flight appeared strange to me. I looked around for the particular grass upon which *E. subochreella* feeds, but could not find any in the locality. I therefore in due course forwarded the example to my valued friend Mr. Stainton for his opinion. He writes to me to say that it is *Trifurcula pallidella*, a rare species on the continent of Europe, and that his examples came from near Vienna. Dr. M. Wocke, in his catalogue of the Micro-Lepidoptera of Europe, says it occurs in Germany, Dalmatia, Italy, Sicily, and also near Brusa, in the north-west of Asia Minor. This species seems therefore to have a wide range of distribution. I have little doubt that I shall again take this interesting addition to our list another season.

TINEA MANCUNIELLA ? N. SP.

During the first week in May last, I was standing on the upper step of the entrance to the Royal Exchange, in Manchester, when I saw a little moth flying about. I captured it with my hat. On my arrival home, my surprise was great to find a very perfect specimen of a *Tinea* unknown to me. This I also forwarded to Mr. Stainton for identification, and he replies that he knows of nothing like it, unless it is an albino *Tinea granella*, as the markings are similar, but the general colour is buff. I can scarcely think it is *T. granella*, for the time of appearance is too early for that species, and I know of no corn warehouse in the neighbourhood. Should this turn out to be a new species, I propose to call it *Tinea Mancuniella*, in honour of the city in which I captured it.

Spring Bank, Preston; December 15, 1879.

LIST OF CYNIPIDES TAKEN IN WORCESTERSHIRE.

By J. E. FLETCHER.

THE following meagre list comprises the cynipideous galls and their originators hitherto collected by me in Worcestershire: nearly all were taken in the last five years. Without entering on the subjects of dimorphism and alternation of generations, I have divided them into two series, bi-sexual and uni-sexual:—

BI-SEXUAL FORMS.

Liposthenes glechomatis.—A few deserted galls found.

Trigonaspis megaptera.—Galls and imago found.

Rhodites eglanteriæ.—Common.

R. rosæ.—Common.

Disastrophus rubi.—Not often found.

Spathegaster tricolor.—Rather common. In 1876 and 1877 two broods, seemingly, were found, with a lapse of about a month between.

S. baccarum.—Usually abundant, but less so since 1877.

S. vesicatrix.—Two galls found at large; but several were obtained by breeding from *Neuroterus*.

Dryoterus terminale.—Formerly common, but less so during the last two years.

Andricus albipes.—Found last spring in two woods, the only places examined for it: the insect was bred from every gall, the shoots having been placed in water.

A. inflator.—Only a few galls found.

A. curvator.—Common in 1876 and 1877, less so since.

UNI-SEXUAL FORMS.

Neuroterus ostreus, *N. lenticularis*, *N. numismatis*.—These seem to be common every year.

Biorhiza renum.—Only twice found, at Monk Wood and Sned Wood, and then very few. Imago not bred.

B. aptera.—Only one imago found; but no special search has been made for it.

Cynips Kollari.—Common.

Aphilothrix radicis.—A few of the perfect insect have been captured.

A. fecundatrix.—The gall was common in 1876, scarce in the next two years, a little commoner the last season. Imago not bred.

A. callidoma.—Three galls only have been found at Monk Wood.

A. albopunctata.—Several galls found.

A. solitaria.—One deserted gall found at Old Hills.

A. glandulæ.—One gall found at Monk Wood.

Aphilothrix corticis.—A few old galls found at Old Hills and Temple Laugherne.

Dryophanta divisa.—Usually common, but less so the last three years.

D. longiventris.—Seemingly not common.

D. folii, L. (Mr. Cameron informs me that this is the true name of our species).—Usually common, but scarce in 1878; a little commoner this year.

I conclude with thanks for the notes appended to the translation of Dr. Mayr's work, recently published in the pages of the 'Entomologist,' which have been interesting and useful.

Happy Land, Worcester; December, 1879.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

DESCRIPTION OF THE LARVA OF GNOPHOS. OBSCURATA.—During the last week, in August, 1877, I took this species not uncommonly on the heaths in the New Forest; and from one of the females eggs were obtained, which duly hatched about the third week of the same month. By the end of November the larvæ were rather over half an inch in length, and still feeding occasionally, though they had not eaten much for several weeks. Towards the end of May following they were full grown, when I described them as follows:—Length about three-quarters of an inch, and rather stout in proportion. The head has the lobes rounded at the sides, but is flat in front, and there is a slight depression on the crown; it is slightly narrower than the 2nd segment, into which it can be partially withdrawn. Body of nearly uniform width, but slightly wider at the middle segments than elsewhere; it is rounded above and below, but the two portions are distinctly separated by a wrinkled raised lateral ridge; the segments are clearly divided, and each is numerously ribbed transversely; the tubercles are raised and rather large for a Geometer; there is also a pair of short but conspicuous pointed prominences on the 12th segment; the anal segment is wedge-shaped, the apex pointing downwards behind. The various prominences and the unevenness of the skin give it a rather wrinkled appearance. Ground colour stone-gray, many specimens having a strong ochreous-purple tinge, others an undecided dull greenish tinge; head stone-gray, thickly marbled in different

specimens with purplish brown or smoke-colour; a double pale gray line (the space on the anterior segments filled up with smoke-colour) forms the dorsal stripe; and there is a similarly pale, but threadlike line above the spiracles. On each side of the 5th, 6th, 7th, and 8th segments a dark streak extends from the spiracular region upwards anteriorly, becoming almost black before meeting in the centre on the front of each segment; in the angle thus formed is a conspicuous pale blotch: in one or two larvæ of the brood, however, these dark streaks are entirely absent, though the pale blotches are still distinct. Tubercles white or gray; spiracles large and round, intensely black; prominences on 12th segment gray, with distinct black streak on front of each. Ventral surface stone-gray, or pinkish gray, thickly freckled with very minute dark smoky spots; it has a pale central stripe, edged on each side with a fine irregular smoky line, enclosing together another double smoky line; there is also a pale stripe (varying much in colour in different specimens, in some being pinkish, in others yellowish) between the central stripe and the spiracular region; this stripe is edged inside with dark smoke-colour. The foregoing is a general description of the brood reared from the New Forest eggs; but two larvæ received from Mr. J. Gardner, of Hartlepool, were much darker, and the markings altogether stronger. One of them had a purplish ground, and the dark streaks on segments 5, 6, 7, and 8 were much larger and broader, and the dorsal area altogether much blotched and marbled with this dark colour, which gave it a very irony appearance. The ventral surface was smoky, with the paler central stripe pinkish, and like the others enclosing the double smoky line. The larvæ were fed on strawberry, and the first moth emerged on August 8th, a rather late date.—GEO. T. PORRITT; Highroyd House, Huddersfield, November 8, 1879.

OCCURRENCE OF *NOLA CENTONALIS*.—I understand a considerable number of specimens of *Nola centonalis* were captured during the past summer, and eggs obtained. This is very interesting, when we remember how long this species and the now no longer rare *Nola albulalis* remained desiderata in our collections.—JOHN T. CARRINGTON.

DEILEPHILA LIVORNICA.—I have recently had brought for my inspection a fine specimen of *D. livornica*, captured August, 1878,

at Derwent House, Borrowash, Derby, by Master B. J. Astle.—J. K. MANN; Wellington Terrace, Clifton, Bristol, December 18, 1879.

LITHOSIA QUADRA IN SOMERSET.—A male specimen of *L. quadra* was taken in a lightish room in Wells, Somerset, on the 15th of September last. I wish to place the fact on record, as my friend Mr. Hudd, of Clifton, states in his Catalogue of the Lepidoptera of the district, "A single specimen was taken some years ago by Mr. Bolt on a gas-lamp in Bristol. The only record in the district." I have taken nothing worth notice save one *Xylina petrificata* this season at sugar. My old visitant, *Polia flavocincta*, came, though in lessened numbers. I have, however, a few series of four at the service of any one wishing the species.—H. W. LIVETT; Wells, Somerset, November, 1879.

NEW LOCALITY FOR DIPTERYGIA PINASTRI.—It may be interesting to northern entomologists to learn that this insect, which seems generally a southern one, appeared pretty commonly at sugar last summer, at Alderley Edge, near Manchester.—H. H. CORBETT; Ravenoak, Cheadle Hulme, near Stockport, November 21, 1879.

STRANGE FOOD FOR HYDRÆCIA MICACEA.—A friend wishing to breed a few *H. micacea* collected some larvæ. Part of these escaped from the breeding cage, and one of these ate its way into the middle of a loaf of bread, where it was there discovered by a young lady, when cutting the bread, to her great disgust.—R. KAY; Bury, Lancashire.

CAPTURES IN SCOTLAND.—It may interest some of the Scotch readers of the 'Entomologist' to know that I captured a specimen of *Emmelesia unifasciata* in this district last July. I had the pleasure of taking also seven fine specimens of *Plusia bractea* at the coast in the beginning of August. Amongst other species taken this season I may mention *Phycis abietella*, *Coccyx cosmophorana*, and *Mixodia rubiginosana* (*Bouchardana*).—WM. WATSON; Newfield House, near Johnstone, November 24, 1879.

ASTHENA SYLVATA.—I think it might be interesting to Mr. G. C. Bignell and others to know that *A. sylvata* has been exceedingly abundant here this year. Thirteen eggs deposited by a captured female hatched out, and I successfully reared the larvæ on birch to

about three-quarter size, when I sent them to a correspondent, but I have not heard anything more about them since.—J. HARRISON; 7, Victoria Bridge, Barnsley.

TORTRIX FORSTERANA.—Mr. Weston* has recorded that Mr. Howard Vaughan bred some numbers of this species from larvæ feeding on ivy (Entom. xii. 219). In 1870 I bred some twelve or fourteen specimens from larvæ and pupæ found in rolled ivy leaves in the gardens of the Royal Botanic Society, Regent's Park. In the 'Entomologist's Weekly Intelligencer' (vii. 127) I find the Rev. E. Horton describes the larva, also from ivy. This ivy pabulum is curious, and I believe has not been noticed on the Continent, although Heinemann, in his 'Schmetterlinge Deutschlands, u. d. Schweiz,' says: "The larva in May on ivy, honeysuckle, bilberry; &c." The greater part of this information is probably derived from Stainton's 'Manual,' where we read, "larva on ivy, honeysuckle," &c. Of other continental authorities, we find Treitschke says, "the larva of *T. adjunctana* feeds between drawn-together leaves of *Pinus picea*." In the 'Isis' for 1848, Madam Lienig gives *Vaccinium uliginosum* and *Ledum palustre* as its food plants. Mr. C. G. Barrett states, on the authority of Zeller, that in Germany it occurs mostly "in fir woods, among *Vaccinium myrtillus*, on which it seems to feed." It was from this plant that the *Ober-Albula* specimens were beaten out (Stett. Ent. Zeit. xxxix. 99); is it the food-plant of our small Scotch form? We know the larvæ of the genus *Tortrix* are especially polyphagous, but if this be the case with *T. Forsterana* it is strange that ivy and privet should be more generally selected in Britain. The life-histories of our Tortrices have been almost entirely neglected; surely many of our lepidopterists would find this an easily worked and paying field in which to labour. If it were cultivated, the gain to our knowledge of species, by the earlier states being described, would be immense. Take the case now before us. We know generally next to nothing of the life-history of a species whose larva and pupa were well figured, by Albin, one hundred and sixty years ago (1720). He says "The caterpillar was of a muddy green, spotted with white. It was found feeding on an oak in Cain Wood the 27th of May: it spun up on the 30th of the same month, and changed into a chrysalis; and the 22nd June came the moth, of an olive colour, spotted with brown." The larva, pupa, and imago are figured on plate 62 (figs. a-d).

The Rev. E. Horton's fuller description is as follows:—"Larva: olive, sides yellowish, legs and head brown, shield lighter brown, with darker irregular hind border. Two black marks on 13th segment, spots slightly paler. On ivy, May 21st. Pupa: black, serrated on upper edge of segments: within leaf May 24. Imāgos emerged June 6 and 15."—EDWARD A. FITCH; Maldon, Essex.

ABUNDANCE OF *EUPITHECIA SUCCENTURIATA* LARVÆ.—On the second Saturday in September I went to Wallasey in search of the larva of *Eupithecia innotata*, and on my way to the collecting ground met with *Eupithecia succenturiata* larvæ in plenty, and at the same time took many cases of *Coleophora*, especially the cases of *Coleophora albicans*. As I did not want *Eupithecia succenturiata* larvæ, and knew, even if I did, I should be sure to see them more numerous by lantern light, I consequently pushed on, and secured the much-wanted *E. innotata* larva. On my way back I met two young friends who had been collecting, and prevailed upon them to keep me company. After dark we could see the larvæ of *E. succenturiata* in twenties on the upper parts of the mugwort plants, whilst during the daytime they are only to be found on the lower portion of the plants, on or amongst the twisted or dead leaves. Few but sickly larvæ remain on the green leaves; hence those who will persist in beating for these larvæ do not get many, and most of those obtained by this process are ichneumonised; whilst by lantern light they may be seen moving about just at dusk, and sitting eating the leaves, or in repose later on where they have fed, but they always retire to the base of the plants at daybreak.—C. S. GREGSON; Rose Bank, Fletcher Grove, Edge Lane, Liverpool.

APAMEA UNANIMIS.—I have to record the occurrence of this insect on Hackney marshes in abundance, over the same ground where for many years few were to be obtained by the most careful searching. In May last I obtained nearly a hundred pupæ in two journeys: these produced imāgos the end of June and July, being quite a month later than usual. The larvæ hibernate and spin their cocoons in April: these may be found under decayed bark on willows, in stems of thistles, burdock, teasle, or in fact anything that affords sufficient concealment.—W. MACHIN; 22, Argyle Road, Carlton Square, E., Dec. 18, 1879.

ZYGÆNA FILIPENDULÆ AND ITS PARASITES.—Last year I

obtained seventy pupæ of *Z. filipendulæ*, from which I bred thirty-eight imagos, five Diptera, two *Tachina larvarum*, Linn., three *Exorista vulgaris*, Fall., and five small ichneumons (*Apanteles* sp. ?), the remaining twenty-two standing over until this year, from which I obtained twenty-two *Mesostenus obnoxius*, eleven male and ten female, between June 19th and July 3rd, the males preceding the females about eight days. The parents of *M. obnoxius* evidently pierced the victim when nearly, or quite, full-fed; for the larvæ of *Filipendulæ* make the usual cocoon, and change to pupæ; the parasite larva feeds within the pupa, and when full fed constructs a strong pupa case within, of the same colour as the outer, and attached to it, forming a part and parcel of the outer covering; the remains of the pupa case of *Filipendulæ* is generally found at one end of the outer case, and the old larva skin at the other. Mr. Meade named the Diptera, and Mr. Fitch the ichneumons.—G. C. BIGNELL, Stonehouse, Nov. 19, 1879.

MESOSTENUS OBNOXIUS, Gr.—The above note upon *Mesostenus obnoxius* most satisfactorily fixes a previously unidentified life-history; the parasite so minutely referred to in the 'Entomologist' (vol. iv. pp. 125-26) by Mr. Henry Moncreaff was clearly *Mesostenus obnoxius*, Gr. This ichneumon has hitherto been considered rare in Britain; there are but two specimens (both females) in the National Collection, and these, I believe, are both referable to the common *M. ligator*. This year, curiously, I have received *M. obnoxius* from both Mr. W. P. Weston and Mr. T. R. Billups, as well as from Mr. Bignell. Mr. Weston's specimens are likewise bred from one year old cocoons of *Zygæna filipendulæ*; and another point in this moth's economy has been elucidated by him, for he found *Anomalon fibulator*, Gr., a frequent parasite; this species, however, invariably emerged the first year. Mr. Billups' single specimen (a very dark female) was captured, but what is most interesting is the variation exhibited by *M. obnoxius* in these three envoies. I specially called Mr. Bridgman's attention to this, and he has added the following note, in which it will be seen how neuration, puncturation, sculpture, and size all vary greatly; there are also other minor variations, such as the white ring in the antennæ of the females; the colour of legs, especially anterior pair in female, &c. C. G. Thomson, in his 'Opuscula Entomologica' (p. 516), does not mention *M. obnoxius*, but he describes a closely

allied new species as *M. subovalis*. There are also five specimens of a distinct n. s. in the Museum British Collection. There is much yet to be learned on the parasites of the closely allied *Zygænidæ*. Mr. J. B. Bridgman has *Casinaria orbitalis*, Gr., bred from *Zygæna trifolii*; Herr Brischke bred *Cryptus migrator*, Fab., from *Zygæna ephialtes*, L. (= *Peucedani*, Esp.); while Rogenhofer bred *Cryptus fumipennis*, Gr., probably only a variety of *C. migrator*, from *Z. Læta*; and Dr. Giraud bred *Cryptus zygænæ*, Gir., as well as this species (*M. obnoxius*), from *Z. Carniolica*, Sc. (= *Onobrychis*, W. V.). In Giraud's record of parasitism it is also stated that *Campoplex decipiens*, Gr., was bred from *Z. filipendulæ*, and that M. Fallou bred *Anomalon zygænæ*, Gir., from the larvæ of *Z. occitanica*, taken at Celles-les-Bains (Ardèche) in May, 1869, upon *Dorycnium subfruticosum*. F. Boie has also recorded in the 'Stettiner Entomologische Zeitung' that he bred *Cryptus zygænarum*, Ratz (= *obscurus*, Gr.), on May 29th, from *Z. trifolii* and *Cryptus filipendulæ*, Boie; on 5th July, from *Z. filipendulæ*. Thomson has also lately (1873) described a *Cryptus* (*Spilocryptus*) *zygænarum*, n. s., which was bred in Zealand (Denmark), by Drewsen, from *Z. filipendulæ*. Speaking of the Braconid genus *Rogas*, Haliday tells us, "De vita et indole nil fere traditum est. Species quædam e larva *Zygænæ filipendulæ* Neesio prodibat." Lastly, we must state that two or three *Chalcididæ*, especially *Chalcis intermedia*, Ns., and *Monodontomerus obsoletus*, Fab., have been bred from *Zygæna* cocoons.—EDWARD A. FITCH.

MESOSTENUS OBNOXIUS, Gr.—The male of *M. obnoxius* appears to be variable. I have, through the kindness of Mr. Fitch, been enabled to examine several specimens of this insect from different quarters, and I find that the areolet varies considerably in width; sometimes the sides are very close together, and the outer nervure is so fine that it almost appears to be wanting; the abdomen also varies much in width, the normal form being elongate-ovate; the 3rd segment being the widest and the same breadth at the base as at the apex, the 1st and 2nd tapering from this; whilst in one specimen, also received from Mr. Fitch, and one in my own collection, the 1st, 2nd, and 3rd segments are in one instance nearly, and in the other quite, of equal width, and the sides almost parallel. Taschenberg says that the 1st segment is without tubercles; this feature is not constant, as in a small specimen I

have (only about half the size of those bred by Mr. Bignell), the tubercles are very distinct, and the portion behind them, instead of tapering, is quite quadrate.—JOHN B. BRIDGMAN.

LIMNERIA LUGUBRINA.—On the 14th July last I gathered several flowering heads of wild carrot (*Daucus carota*) that I found growing on the tops of the cliffs, under the Plymouth Citadel, from which I bred, between the 14th and 30th August, many *Ecophora flavimaculella*, and its parasite *Limneria lugubrina*, Holmgr. Mr. Fitch, with his usual kindness, named it for me, and at the same time observed that it was new to Britain.—G. C. BIGNELL; Stonehouse, Plymouth.

ODYNERUS PARIETINUM, *Linn.*—During the first week of July, 1879, I noticed several specimens of a fine *Odynerus* in the windows of one of my rooms. At first I thought they were a very large variety of the common *O. parietum*, but all being so exceptionally large I captured three, and then at once saw they differed from that species not only in size, but in general appearance. Especially noticeable was the band on the first segment of the abdomen. Shortly after this, through the courtesy of the author, I received a copy of Mr. J. B. Bridgman's 'Chrysididæ and Aculeata of Norfolk.' In looking through this admirable list, which notices 246 species as occurring in the neighbourhood of Norwich, and contains so many valuable observations, I found "*Odynerus parietinum*, *Lin.* = *parietum*, var. *Smith*. Not uncommon in some seasons. There is a very good figure of this distinct, fine species in Curtis's 'British Entomology,' iii. 137, female." This at once reminded me of my insect, and on sending specimens to Mr. Bridgman their identity with *O. parietinum* was confirmed. *Parietinum* is an altogether finer species than *parietum*, the apex of the posterior tibiæ are dark, and the abdominal band is more sharply and deeply interrupted, not regularly angular or uniform as in *parietum* (see figure). If



Parietum. Parietinum.

First segment of abdomen.

Smith really knew this species it is difficult to think how he could have overlooked it, although the points mentioned are certainly

somewhat inconstant in the variable and common *O. parietum*. There is no specimen of the true *O. parietinum* in the National Collection, but Curtis's figure is, as usual, very fine. Illiger was the first who clearly differentiated the two Linnean species, but Wesmael reunited them in his monograph (Mon. Odyn. Belg., p. 24, and Supp., p. 6). The *O. parietinum* of Fabricius, Schrank, or Panzer is not this species.—EDWARD A. FITCH; Maldon, Essex, August, 1879.

THE GLOWWORM.—Near midnight, the 8th of October, my neighbour, Mr. Johns, of St. Marychurch, travelling between Cherston and Dartmouth, in Devon, when about a mile from the former place, observed four glowworms shining brightly in the grass by the roadside, and brought one of them, alive and active, to me the next day. Mr. Knapp, in his pleasant 'Journal of a Naturalist,' says that glowworms can hardly be said to shine after the middle of July, except that he has "repeatedly noticed, deep in the herbage, a faint evanescent light proceeding from them, even as late as August and September." And then he describes one particular occasion, a warm, dewy evening, September 28th, 1826, when he saw multitudes of evanescent sparks in the grass. But "instead of the permanent green glow that illumines all the blades of the surrounding herbage, it was a pale transient spot, visible for a moment or two, and then so speedily hidden that we were obliged, in order to capture the creature, to employ the light of a candle." (*Op. cit.*, p. 303). But the fact I am now communicating occurred even much later in the season than this; and the display of light was not to be distinguished from its summer brightness.—P. H. GOSSE; Sandhurst, Torquay.

MYCETOPHAGUS QUADRIGUTTATUS, Müll.—From the numerous enquiries I have received for this insect it would appear to be by no means common. I find it fairly plentiful in spring and autumn in a feeding-bin in one of my cow-sheds. This bin is nothing more nor less than a narrow portion of the shed fenced off, and filled about half full of clay, firmly rammed down. A few old boards are placed on the clay, and it is attached to, and in the dust and seeds beneath these boards, that I find the beetle. It would seem that the grand secret of the beetle's presence lies with the boards, for I have been unable to find it in any bin

without these loose slabs. On what does the insect feed? A fine brown powder comes off the wood when handled, similar to, if not identical with, that produced by dry-rot; but I have found nothing of a fungoid nature, unless this may be called so. I shall be pleased to send a few unset specimens to any gentleman in want of this species.—THOS. H. HART; Kingsnorth, Ashford, Kent.

PRIONUS CORIARIUS AT RICHMOND PARK.—Whilst digging for pupæ in this park on the 1st inst., I came upon a dead specimen of this beetle at the roots of an oak: the specimen is somewhat imperfect.—N. C. GRAHAM; November 3, 1879.

COLEOPTERA BROUGHT DOWN BY FLOODS.—It sometimes happens that a very extensive assortment of such beetles as live on the ground or among low herbage may be fished out of the water in time of floods. During the frequent inundations which have happened this year in the Aylesbury district I have thus met with many individuals, but very few species. *Carabus monilis* and *C. nemoralis* (the former by hundreds), *Clivina fossor* and *C. collaris*, *Byrrhus sericeus*, *Pæcilus cupreus*, *Amara cursor*, *Notiophilus biguttatus*, and three species of *Agriotes*, are all I could distinguish among the heaps I searched over. From these captures either the present is a very unentomological season or central Bucks is a very unentomological district.—C. R. SLATER; 18, Wray Crescent, Tollington Park, N.

LOCAL COLORATION OF INSECTS.—On comparing two series of *Aromia moschata*, the one captured by myself at Tottenham, and the other collected by my father (J. W. Slater) in the East of Europe, I was struck with the fact that whilst the former were almost all bright green, the continental specimens were of a reddish bronze. I should like to know if this difference has been observed by others, or if it is merely accidental.—ID.

NOTES ON THE LARVA OF CHRYSOPA.—On August 21st, 1879, I found a number of eggs of a species of *Chrysopa* on an ivy stem. The larvæ had just hatched, but were still on the egg-stalk. They were semitransparent, and seemed to experience some difficulty in descending from their elevated position. The antennæ were very long and three-jointed; the third joint is shorter than the other two, and the basal joint is very thick; the antennæ are covered

with scales, which make them appear rough. The mandibles are huge curved organs, serrate on the inner side at the tip. The maxillæ are three-jointed, lying forward between and below the mandibles; the middle joint is the longest. The eyes are large, and there are no ocelli. The corneal facets are very prominent, so much so that the eyes look like a collection of ocelli rather than a single compound eye. There is a bristle above and below each eye, and four others arranged in a quadrangle on the head. The labrum is shield-shaped with two long horns. The femora are short, the tibiæ long, with rows of hair. The tarsi are one-jointed, and provided with two hooks and a wineglass-shaped sucker. The prothorax is short and broad; the mesothorax has two papillæ bearing hairs; the metathorax and the six following segments are covered with similar hair-bearing papillæ, of which some, especially the lateral ones, are double. The abdomen then narrows, finally dilating at the tip. The animals fed on aphides of any kind, and eventually one ate up the other three in the box with him. They seize the aphides with their mandibles and suck them dry, then, lifting them on the end of the mandibles, place them on their backs, where they are held by the long hairs. Often the aphid resists, trying to beat off the *Chrysopa* with its feet, but the fight is not of long duration. Sometimes when there are no more aphides the *Chrysopa* places pieces of stick and other rubbish on its back. It is probable that the *Chrysopa* so covers itself to conceal itself from the aphides, among which it feeds. But it seems to me that the larva of *Cassida*, which similarly bears its excreta on its back, does so to mimic the *Chrysopa* larva rather than to conceal itself or shade itself, as has been suggested, from the sun. On September 2nd one changed its skin. When I saw it, it had firmly fixed itself by its tail to the glass of the box in which it was confined, and was nearly free. The limbs lay folded together, and were transparent; it extricated itself from the skin by wriggling the body, standing almost upright on its tail. Previously to this all had been becoming darker; now the one who had cast his skin was quite clear, but he very soon got darker, being spotted with dark grey on the belly and dark in colour on the back. Shortly after, this one ate up all the others who had grown much more slowly, and were not so far advanced. Now the mandibles are reddish yellow and transparent, darker at

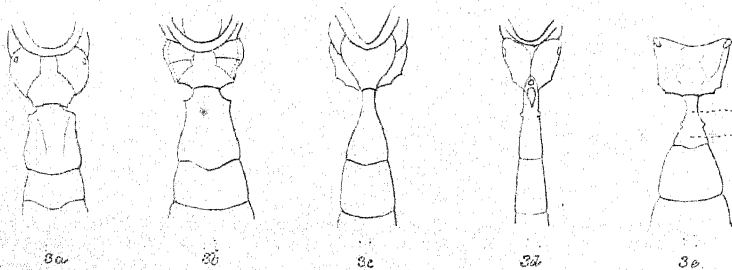
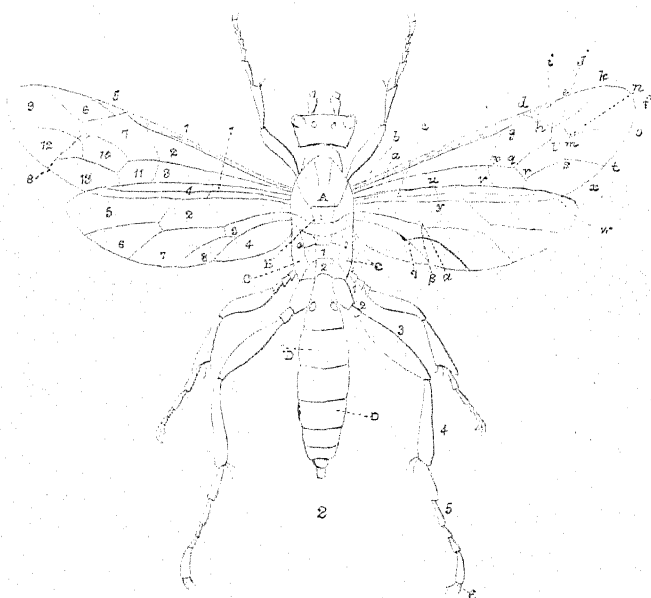
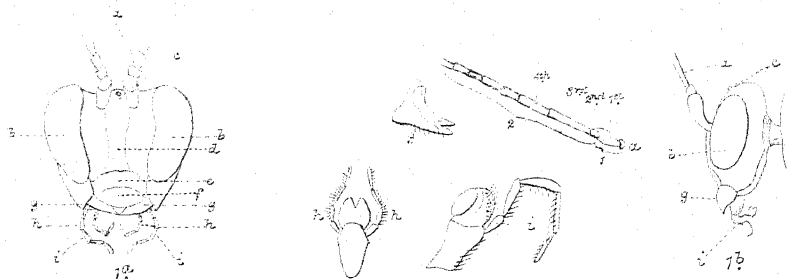
the tip; the last joints of the maxillæ are black; the head is marbled with a purplish grey; the back is of a dark brown, the hairs clear and matted. The limbs are also transparent, and still bear the little suckers on the tarsi. The abdomen is white, with grey spots. The animal has remained quiescent for some time lately, the supply of aphides having now ceased, owing to the unsuitable weather, and I conclude that the animal will hybernate, and probably enter the pupa state about May, for it is by no means full grown yet.—H. N. RIDLEY; Bishopstone, Hereford.

WEST LONDON ENTOMOLOGICAL SOCIETY.—The Annual Exhibition of this Society was held on 4th and 5th December, 1879, in the Church Room, St. Mark's, Grosvenor Square, W. Most London entomologists look forward to seeing a good show at the West London Exhibition, but this year the Society outdid itself. Much credit is due to all the members who exhibited and otherwise helped, but to the President, Mr. E. G. Meek, and the Honorary Secretary, Mr. Godwin, are especially due the thanks of the Society and visitors. The former exhibited the fine collection of Lepidoptera formed by the late Mr. Waring, of Norwood. Being one of the oldest in the country, this collection contains examples of nearly every species ever taken in this country. Dr. Harper sent in four drawers of the genus *Peronea*, which are exceedingly interesting, although perhaps a little crowded, but if that is a fault it can easily be remedied. Mr. Howard Vaughan showed a drawer of plumes (*Pterophorina*), also a drawer of *Cidaria russata* and *C. immanata*. The latter was of interest in exhibiting geographical variation, besides being very beautiful series. Mr. Vaughan also exhibited a long series of *Cidaria reticulata*, from Windermere. Mr. Briggs' varieties of Lepidoptera commanded great attention. *Lycæna Corydon*, a fine drawer, two hermaphrodite *Anthocharis cardamines*, five *Fidonia atomaria*, one being black as *Boletobia fuliginaria*, &c. Mr. Fry sent two drawers of the genera *Dianthæcia* and *Polia*; also side by side specimens of *Hadena assimilis* from Scotland and Iceland. Mr. Meek showed, in addition to the large collection already mentioned, *Nonagria sparganii*, new to the British list;

Platypteryx sicula and its preserved larvæ from Bristol; *Boletobia fuliginaria*, captured in the Old Kent Road, by Mr. Upton, on August 3rd last; also series of *Eupæcilia gilvicomana* added to British list this season, and series of *Phlæodes crenana* from Scotland. Mr. Boden exhibited a beautiful case of varieties of his own capture, including *Colias Edusa*, *Thecla rubi*, *Angerona prunaria*, *Hibernia leucophearia*; also specimens of *Phoxopteryx upupana*, *Penthina fuligana*, *Coccyx pygmæana*. The Secretary sent a very interesting case of the life history of *Argyrolepis æneana*, showing the way the larva feeds in the stems of *Senecio Jacobæa*; Mr. Simmons a case containing *Deilephila galii*, *Cucullia gnaphalii*, *Plusia orichalcea*; also examples of foreign Lepidoptera captured about the London Docks. Amongst the other orders of insects were Coleoptera, several drawers shown by Mr. Bull. Insect anatomy was shown through microscopes by Mr. Chas. Wyatt. The room was tastefully decorated with cases of natural-history subjects, contributed by Messrs. Meek, Dow, Beven, Anson, &c. The Society is to be congratulated upon filling a large room with so many valuable specimens and beautiful objects. The promoters of the exhibition must have been gratified with the evident appreciation of the large numbers who attended on the two evenings it was open.—J. T. C.

OBITUARY.

THOMAS ATKIN.—Thomas Atkin was born at Stapleford, May 5th, 1813, and died November 8th, 1879, at Nottingham. He was brought up as a warper of laces, but changed this occupation to that of a machine fitter. For the last thirty years of his life he took an active interest in Natural History, especially Entomology. This taste gained for him many friends amongst the naturalists of the Midland Counties. One of the founders of the Nottingham Working Men's Naturalist Society, he from time to time filled the offices of President and Vice-President, and served on the Committee, of that Society. He was otherwise useful in reading papers, demonstrating the microscope, &c. In such high respect was he held by the members that four of them carried him to his last resting-place.—J. T. C.



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INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By J. B. BRIDGMAN AND E. A. FITCH.

NO. I.—INTRODUCTION.

OUR previous articles in the 'Entomologist' (Entom. xi. 34, 156) have shown that the interest in Ichneumons is greater than had been expected. During the past year we have received some hundreds of specimens for determination, many communications asking for a satisfactory guide or comprehensive English work on the group, and not a few promising to take up this interesting branch of Entomology as a special study if we can only recommend a starting-point. To this last enquiry we now attempt an answer in a few introductory papers on British Ichneumons generally. In the collections we have received it has also been apparent what a vast number of insects (belonging to totally different families), of very different shape and structure, may be comprehended under the name of an "Ichneumon fly;" so not only is new information to be given, but much old knowledge is to be corrected.

First, it may perhaps save a great deal of trouble and confusion if we describe the principal parts made use of in the discrimination of the Ichneumonidæ, and illustrate them clearly, as is the case on the accompanying plate.

To commence with the head:—Fig. 1 *a*, gives a front view; fig. 1 *b*, a side view: *a* represents the antennæ, of which *a*¹ is called the scape and *a*² the flagellum; in Ichneumons the joints are numerous, and as usual are numbered from the base; the antennæ are mostly setiform or setaceous; *b b*, represent the eyes; *c*, the ocelli, which are always on the vertex; *d*, the face; *e*, the clypeus; *f*, the labrum; *g g*, the mandibles; *h h*, the labial palpi; and *i i*, the maxillary palpi. In Fig. 2, *A* is the meso-

thorax, *B* the scutellum, *C* the metathorax, and *D* the abdomen. The neururation of the wings is of the utmost importance, and although the nomenclature varies it is well that great attention be given to the accompanying explanation, which is after Haliday:—

AREOLÆ.	NERVI.
(<i>Left fore wing.</i>)	(<i>Right fore wing.</i>)
1. Costal.	a d. Costal.
2. First humeral.	b g d. Subcostal.
3. Second humeral.	b q. Anterior, or præbrachial.
4. Third humeral.	c w. Posterior, or pobrachial.
5. Stigma.	c y w. Axillary.
6. Radial.	e k. Metacarpus.
7. First cubital.	h i j k. Radius (3 abscissæ)
8. Second cubital (areolet).	l o. Cubitus.
9. Third cubital.	r t. Anal.
10. Prædiscoidal.	g p. p v. Brachial recurrent.
11. Podiscoidal.	u y. Axillary recurrent.
12. Externomedial.	i l. j n. Intercubital recurrent.
13. Anal.	l q. Interior discoidal recurrent.
	m s. Exterior discoidal recurrent.
	q r. Posterior discoidal recurrent.
(<i>Left hind wing.</i>)	
1. Costal.	
2. Præbrachial.	
3. Pobrachial.	
4. Axillary.	
5. Radial.	
6. Cubital.	
7. Discoidal.	
8. Anal.	
	(<i>Right hind wing.</i>)
	$\alpha \beta \gamma$. Transverse anal.

Of the legs—1, is the coxa; 2, the trochanter; 3, the femur 4, the tibia (with apical spines); 5, the tarsus (of five joints); 6, the claws. Figs. 3 show the different forms of abdomen:— 3^a , is sessile; 3^b , almost sessile; 3^c , subsessile; 3^d , subpetiolated; 3^e , petiolated, *a* is the petiole, *b* the post-petiole. Fig. 4 shows the abdomen, with the aculeus or ovipositor hardly exerted in *Ichneumon* 4^a ; and very long in *Rhyssa* (Pimplidæ), 4^b .

The terebrant Hymenoptera, which are distinguished by having an ovipositor and no sting in the female, are primarily divided into two sections: one, in which the three great divisions of the body are less distinctly marked than in the higher

Hymenoptera and which have a caterpillar-like phytophagous larva, comprises the sawflies, or Tenthredinidæ; the other section comprises seven tribes of mostly parasitic insects, in which the division between the thorax and abdomen is very distinct, and all have legless, entomophagous (except part of the Cynipidæ), larvæ. These have been tabulated as follows, by Latreille:—

- | | |
|--|------------------|
| A. Ovipositor simple. | |
| a. Ovipositor partially coiled, and proceeding from
near base of abdomen. - - - - | 1. CYNIPIDÆ. |
| b. Ovipositor straight. | |
| * Ovipositor of three pieces. | |
| † Antennæ straight. | |
| ‡ Abdomen inserted at extremity of metathorax. | |
| § Two recurrent nervures. - - - - | 2. ICHNEUMONIDÆ. |
| §§ One recurrent nervure. - - - - | 3. BRACONIDÆ. |
| ‡‡ Abdomen inserted upon the back of meta-
thorax. - - - - | 4. EVANIIDÆ. |
| †† Antennæ elbowed. - - - - | 5. CHALCIDIDÆ. |
| ** Ovipositor tubular. - - - - | 6. OXYURA. |
| B. Ovipositor jointed. - - - - | 7. CHYSIDIDÆ. |

This shows the place which the true Ichneumons occupy amongst the parasitic Hymenoptera; the somewhat anomalous and rare *Trigonalys* is included in the family Aulacidæ, which is a subsection of the Evaniidæ. There are of course many other distinguishing characters, but the beginner will soon find it easy to separate a true Ichneumon, with its long, slender, well-defined abdomen, its thickly-veined wings, and its mostly long exserted ovipositor, from a Cephus or Sirex, a Cynipid, a Braconid, a Chalcid, or a Proctotrupid (Oxyura). With the few apterous species there may be more difficulty at first.

The eggs of Ichneumons vary greatly: many are whitish or pellucid, and peduncular in shape, while others are shining, black, and oval; in some species they are merely glued to the outside skins of their victims, while in others the female pierces the prey and deposits its egg within the victim egg, or larva, as the case may be. The means used and difficulties overcome in effecting this oviposition, in certain cases, is most interesting. The larvæ of the Ichneumonidæ are all internal parasites on other insects, hexapods of all orders, and frequently in the eggs

of certain Arachnida; a few are hyperparasitic, that is, are themselves parasitic on other hymenopterous parasites. In the case of hexapod larvæ the parasites feed on the fatty tissues of the victim, and continue so to do till its eventual exhaustion, which in many instances is not until the penultimate or pupa state has been assumed, though some parasites have been reared without the host's destruction. Many species are solitary, others gregarious; that is, several examples prey on the same host. The larvæ of many genera spin cocoons, mostly within the puparia of their victims. Giraud, Perris, Walsh, Walker, &c., have held that the larvæ of certain Chalcididæ, belonging to the family Eurytomidæ, were partially or wholly herbivorous; but this is very doubtful, and contrary to analogy; so Dr. Giraud's assertion, that the larva of *Pimpla graminellæ* is only carnivorous in early life and herbivorous for the rest of its existence, greatly needs further confirmation; but see Mr. Cameron's note in Ent. Mo. Mag. xiii. 200. The economy of the Ichneumonidæ is very varied, and will be referred to in more detail later on; however, where practicable, it is recommended that the vast amount of information and the excellent plates, especially the life-history plate ix., of Ratzeburg's 'Die Ichneumonen,' be consulted, more especially his twelve Krankengeschichten in the third volume.

Ichneumon imagos are to be found almost everywhere; they are mostly lethargic in their habits, and are easily captured when running and skipping amongst low herbage or on the leaves of trees. A few species are attracted by flowers, especially the Umbelliferæ; and another fruitful source is the sifting and examination of moss and *débris*; this means of collecting is especially productive of the wingless *Pezomachi*, and other small Cryptidæ. Most species are diurnal in their habits, but a few, such as some of the Ophionidæ, are frequent visitors both to light and sugar. Many species hibernate as imagos. Bred species are known to the student of every order, and we can only express a hope that their preservation was more general.

Our British list contains some of the most beautiful species. The arrangements in black, red, and yellow, amongst the Ichneumonidæ and Cryptidæ, are most varied. The testaceous Tryphonidæ and Ophionidæ are often very beautiful and delicate. While the black Pimplidæ, although generally with a very sombre dark look, comprise some of our largest and most beautiful

species, *e.g.*, the very large and pretty *Rhyssa persuasoria* and the black *Ephialtes*, with their long ovipositors; *Glypta*, also, is a pretty genus; but it must not be concealed that many of the genus *Pimpla* have far from a pleasant odour when handled. The Agriotypidæ contains but one genus with a single species; this Mr. Walker was fortunate enough to detect as parasitic on certain Trichoptera, hence it is somewhat aquatic in its habits.

Part III. of the Entomological Society's Catalogue of British Insects contains the Ichneumonidæ. This is compiled by the Rev. T. A. Marshall, and a most laborious task it must have been; but, as might be expected from so conscientious a worker, it is almost perfect, and must remain the standard for all future British work on the subject. The author's remarks (Trans. Ent. Soc. Lond., 1872, p. 259, and Ent. An., 1874, pp. 114—146) should also be consulted. This catalogue is full of the necessary citations and references to the works and monographs of Gravenhorst, Wesmæl, Ratzeburg, Förster, Holmgren, and Taschenberg, and to the scattered papers or less important works of Zetterstedt, Ruthe, Kriechbaumer, Thomson, &c.; and of our own Curtis, Stephens, Westwood, Haliday, Desvignes, &c. The later papers or works of Thomson, Kriechbaumer, Brischke, Holmgren, or Vollenhoven, are of necessity not included, as the catalogue was issued on November 4th, 1872. In it 1186 species of Ichneumonidæ are included as British, distributed amongst 136 genera. Of these the author says that at least 15 species are doubtful natives: one of these, certainly, has been confirmed, and there have since been several additions made to the British list, while a few others have been overlooked. The extension of this list will not be difficult. Mr. Marshall had a large number of undetermined British specimens in his possession, the record of which his absence from this country will probably deprive us; however, one of the results of the present Ichneumon revival will be to add many species to the already large British fauna. Another and more important result will, we hope, be a large gain to our now comparatively small stock of knowledge on the parasitism and general habits of the various species; this also will help greatly to their more systematic arrangement, and give a solution to many of the problems connected with those species, of which one sex only is yet known, which happens very frequently throughout the Ichneumonidæ. No country can boast of such an

army of working entomologists as Britain, where probably more insects are bred from their earlier states than in all the rest of Europe; under these circumstances the various parasites (especially of Lepidoptera) should be well known, but such is not the case. Had these been preserved, and either sufficiently labelled or recorded by short notes in these pages, the materials at the disposal of British hymenopterists would have certainly developed an English authority and English memoirs on this interesting group; but this we lack. As it is, and as Mr. Marshall has remarked, "progress in Ichneumonology requires a large staff of workers, and a division of labour;" thus either the student of the *Hymenoptera pupivora* must be a first-rate general entomologist, or else co-operation must exist, so that the preyer and the preyed upon may be correctly determined. Erroneous information is worse than useless. Let us, therefore, appeal to the students of other orders to attempt to preserve their bred parasites, which we hope will not be difficult with the following instructions. The knowledge of the internal parasites should surely form part of the life-histories of the various species they affect, and in the case of injurious insects their recognition and preservation is of real practical value.

Since it is extremely difficult to identify Ichneumons, whose specific characteristics are often very minute or obscure, unless some care has been taken in their killing and setting, the following hints as to the best methods to pursue are entered into rather fully. First, as regards killing, there is nothing equal to the fumes of burning sulphur; this permanently fixes the red and yellow with which so many species are marked. Cyanide of potassium changes these colours, more especially the yellows, which it turns into a fine red, and consequently spoils the specimens. This, as well as chloroform, also renders them so rigid that it is with difficulty that the limbs can be displayed. If the insects are killed with sulphur and put into a zinc box, with a little damp sand or a piece of blotting-paper moistened with water to which a drop or two of carbolic acid has been added (of course the insects are not to be laid on the moisture, but put in a wide-mouth bottle or other convenient receptacle), and left for two or three days, they will be in splendid condition for setting; they may even be kept there for a week, provided they be kept cool and not allowed to dry. There are two methods of mounting,

each of which has its advantages and disadvantages; no doubt, generally speaking, carding is the better plan, because the insects are less liable to be injured in examination and transit than if they were pinned. Should they be carded it is better to cut a V-shaped piece out of the card, and place the head and shoulders over the aperture. Thus made, the piece can very easily and neatly be cut out with a pair of punching-pliers, such as are used by the railway officials to snip the tickets; this allows the examination of the face and under part of the front legs. It is a good plan to leave one wing free, as by this means the side of the thorax and coxæ are exposed, or, better still, to card one specimen on its back when no doubt exists as to the specimens belonging to the same species. In pinning carded specimens a rather long strong pin is a great advantage (No. 14 is a good pin for this purpose). The general directions for neat and successful carding are fully entered into in the next article by Dr. Capron, who is quite a *maestro dell'arte*. If the insects are to be pinned always use a long pin; it is better to have the pin too long than too short, as with the latter many insects must accidentally become damaged whilst handling them. No. 7 was the pin generally used by the late Mr. Frederick Smith, and is a very useful pin, but for some even a larger one may be used with advantage. But whatever size is used the insect should be placed well up the pin, so that the legs may not be injured when stuck into the store-box or cabinet, and besides, it allows room for a label to be put on the pin beneath the insect. For setting nothing is better than two thicknesses of cork fastened on a flat board, and covered with white paper. The legs can then be extended, and the wings held in position by small card braces; if the insects have been kept a day or two in the damp box no difficulty need be experienced with the wings; should they not fall at once into their places they may easily be made to do so by pressing the base of the metathorax gently with the handle of the setting-needle (which may be cut wedge-shaped for the purpose) towards the head, when the wings will immediately fly forwards and downwards. As it will be found better to pin some Ichneumons and card others, when special setting is advantageous, it will be hereafter referred to.

As we have above stated, the Ichneumonidæ have been divided into six principal groups or families, principally by the shape of

the abdomen, length of ovipositor or aculeus, and form of the areolet (second cubital areola) if present.

The families of this group may be briefly defined as follows, always bearing in mind that most of these families possess some species or genera which at first sight might be placed in some other family; for instance, in Tryphonidæ we find species with a pentagonal areolet, as *Adelognathus* and some of the *Orthocentrus*, whilst *Orthocentrus anomalus* has an aculeus as long as the abdomen. And in the Cryptidæ the genus *Stilpnus* has the aculeus not projecting.

- A. The 2nd segment of the abdomen about four times as long as the 3rd. - - - Fam. 3. AGRIOTOPIDÆ.
- B. The 2nd segment not more than twice as long as the 3rd, generally subequal.
 - a. Areolet of wings a regular pentagon or quadrate, the external nervure sometimes pellucid or wanting.
 - * Mesosternum not separated from the mesopleura by a depression (sometimes a very short depression present). Aculeus very short, or hidden. - - - Fam. 1. ICHNEUMONIDÆ.
 - ** Mesosternum separated from the mesopleura by a distinct depression, sometimes complete (female sometimes apterous); aculeus projecting sometimes as long as the abdomen. - - - Fam. 2. CRYPTIDÆ.
 - b. Areolet small, deltoid, or none.
 - † Abdomen depressed, rarely subcompressed at the apex.
 - † Aculeus of female very short, often hidden. Fam. 5. TRYPHONIDÆ.
 - ‡ Aculeus of female long, generally more than half the length of the abdomen - Fam. 6. PIMPLIDÆ.
 - ‡ Abdomen more or less compressed, often very much so; aculeus sometimes hidden, rarely as long as the abdomen. - Fam. 4. OPHIONIDÆ.

A better idea of the generalities of these families can of course be obtained by the beginner from the examination of some typical collection, or, failing this, from Ratzeburg's, Curtis's, or Vollenhoven's figures. The three excellent plates in Vollenhoven's 'Schetsen ten Gebruike bij de Studie der Hymenoptera,' Part 1,

will be found very useful, and is cheap at half-a-crown; 'Pinacographia' is very valuable, but expensive.

In the subsequent papers these six families of our Ichneumonidæ will be treated of in both systematic and biological detail.

ON THE PRESERVATION OF PARASITIC HYMENOPTERA.

By EDWARD CAPRON, M.D.

It is of above all things necessary to determine the names of the smaller species of Hymenoptera, that they should be set in such a manner that all the important characters should be plainly visible, and that the thorax should not be entirely destroyed by a pin as large as itself, which is generally the condition in which I receive specimens from correspondents. If killed by the ordinary methods, such as cyanide of potassium, laurel, or chloroform, the insects almost always die with the wings folded vertically and the legs contracted, and so rigid are the muscles of this class that, unlike Lepidoptera, no amount of relaxing can be effected by moisture, and the insect is generally useless. After many trials I have found the plan I adopt so successful that I think it is worthy the attention of those who intend to study this most interesting group. In the first place, however, it is necessary to bring the insect home alive, and not damaged by its capture; nothing spoils the appearance of a fine Ichneumon so much as a missing leg or antenna. These insects are so active in a net that they will often give you the slip before you are aware of it and escape altogether. My plan is as follows:—

I take with me a pocket full of medium size chip-boxes, or rather large pill-boxes, and a wide-mouth bottle with a large cork, charged moderately with cyanide of potassium. I place this over the insect in the net, and hold my hand on the top (the net being between) until the insect is just stupefied but not dead. With the smaller ones this occurs almost at once. I then remove it, and examine it with a lens to see if it is worth saving; if it is I transfer it to one of the boxes. By the time I reach home the insect will be as lively as ever, and I then kill it in the following manner:—I take a large white basin and fill it with quite boiling water. When it has cooled a few degrees I take each box and give it a tap to send the insect to the bottom, and then suddenly

take the lid off and invert it over the water, again tapping the bottom to send the insect out. In nine cases out of ten the insect falls on to the hot water with its wings expanded horizontally, and the legs stretched out. It should not be left long on the hot water, but almost immediately be lifted out with a camel's-hair brush, and placed into another vessel of cold water. When all are thus killed I take a cup of spirits of wine. It should be of full strength,—the ordinary *spiritus rectificatus* of the Pharmacopœia,—and not methyated, as this is apt to be greasy, and unpleasant to the taste and smell. I immerse each insect in it, and, placing under them an ordinary glass microscopic slide, I lift them out carefully, the insect being on its back. I then brush out the legs, wings, and antennæ, absorb the superfluous spirit by the brush, occasionally drying the latter on blotting-paper or by the mouth, and put it aside to dry. This is accomplished in a few minutes, and the insect can then be easily removed from the slide in the most excellent condition for the setting process, which I will now proceed to describe.

The materials required are some small squares of stout six- or eight-sheet Bristol board, such as is used for mounting drawings, and the following solution: gum acacia, one ounce; white sugar, half an ounce; water two ounces. It should be thoroughly dissolved, and is best made some time, and kept until it is very thick and flows with difficulty. The insect being ready, a rather thick line of gum should be placed on the cardboard about the length of the whole insect, and as wide as the body. The insect should be then lifted on to it, taking great care not to touch the wings with the gum. The head should be well into the gum, and be first raised and placed into position with a needle inserted into the other end of the stick which holds the brush. Then the two front legs should be placed in their right position, and fastened securely by the brush and gum. The wings may then be carefully placed with the wetted brush, and, lastly, the two posterior pairs of legs and the antennæ. The gum should be used freely, as it can all be removed afterwards.

The insect should then be placed on one side until perfectly dry; indeed, I leave mine thus prepared until the winter gives me time for their examination. When thus required I place a large drop of water on the insect, and when the gum is well dissolved I again remove it off the board to a cup of clear water,

from thence into the spirit, and this time dry it with its back upwards on the glass slide. It may then be removed quite stiff and well-set, and mounted on a piece of thin card with only a slight dot of gum under the thorax.

Though apparently troublesome, the process comes easy enough after a little practice. I have often mounted thirty or forty specimens in a couple of hours, and have succeeded in the smallest Chalcids, and even the most difficult and unruly Cynipidæ. The reason of adding the sugar to the gum is to make it more quickly soluble in water, and it also dries quicker and firmer. Great care should be taken to wash off the gum thoroughly in the last washing, as otherwise the wings might stick to the glass slide. I have tried the same plan most successfully with the Tenthredinidæ, and also with Coleoptera, and even kill bees in the same manner. It is certainly the best way of obtaining perfect relaxation after death.

Shere, Surrey, November, 1879.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By WALTER P. WESTON.

(Continued from p. 9.)

Antithesia salicana, Gn.—Common among the larger kinds of sallow, and occasionally to be met with on the trunks of poplars. It flies boldly and quickly at dusk in June and the early part of July, but is one of the species that does not travel quietly when boxed. It may also be taken plentifully in the daytime at rest on the stems of pollard sallows, and willows.

Spilonota ocellana, Fab.—Common everywhere, and particularly so among whitethorn hedges. The larva appears an ubiquitous feeder, for, besides apple and whitethorn, it affects shoots of alder (*Alnus glutinosa*), and occasionally sea-spurge (*Euphorbia paralias*), and the common dock (*Rumex obtusifolius*). *S. hippophæana*, which derived its name from the larva feeding in united shoots of sea-buckthorn (*Hippophæa rhamnoides*), though ranking for a time as a species, must be considered but a form of this insect. When alive the whitish portions of the wing certainly appear lighter and clearer than in *S. ocellana*; but on rearing a long series no difference can be perceived in the two forms, both of which

present similar varieties. The sexes will also pair indiscriminately.

S. lariciana, Zell.—Local among larch (*Larix europæa*), but generally abundant where it occurs. It is as variable as the preceding in colour and markings, but may readily be distinguished from it by having much narrower wings. The moth may be taken commonly in June and July flying at dusk round the larches, but as it usually keeps about ten or twelve feet high up the tree, a long net is very handy when after this species.

S. aceriana, Dup.—Not uncommon among black poplar (*Populus nigra*), and more sparingly among aspen (*P. tremula*). Last year I noticed, adhering to the shoots and leaf-stems of the large-leaved balsam poplar, close to London, some curved case-like appearances, which at first sight I took for the cases of a *Coleophora* larvæ. On examination, however, they turned out to be composed of stout whitish silk with the outside covered with frass. On detaching some from the twigs I found each covered a small hole in the stem, in which a larva was feeding. I kept several of the shoots in water, and reared a series of this insect, the transformations from larva to imago occurring generally within the shoots, which did not appear materially injured by their presence.

S. pauperana, Dup.—The old locality for this insect, given by Stainton in his 'Manual,' was "hedges and lanes near Darenth Wood," but, though frequently worked for, this species is now very scarce there. I met with a single specimen flying slowly in the sunshine over wild rose bushes in Surrey, in 1877, as far as I am aware the first occurrence of this species in that county. I do not know of any captures in Sussex.

S. dealbana, Fröl.—A variable species, and specially abundant in woods and woody lanes.

S. neglectana, Dup.—Local, but generally abundant where it occurs. It is usually to be found on the trunks of large willow, and sometimes poplar, trees; and occurs freely at Camberwell, Hammersmith along the banks of the river, Surbiton, and similar localities. It may easily be distinguished from *S. dealbana* by the bluish black markings which in that species are of a reddish brown. This is also rather a larger insect, and does not vary.

S. simplana, F. v. R.—Very local among aspen (*P. tremula*). Darenth Wood used to be its chief locality, but the part of the

wood where it occurred has been closed to entomologists and the public. It has also been taken in Tilgate Forest.

S. amænana, Hub.=*incarnatana*, Hub.—Appears both scarce and local in these counties. On one occasion I took a couple of specimens by beating wild roses on Box Hill, but have not worked the locality since. It has not been included in any list I have received.

S. suffusana, Zell.—Not uncommon among whitethorn, but is not a free flyer when disturbed. By beating whitethorn hedges into an umbrella in the early part of May several pupæ of this species may be obtained. If the Tortrix collector selects a favourable hedge for this kind of work, which should be fairly close-trimmed but not thinned, he will find an afternoon's work very profitable, as, besides this species, he may reckon on a series of *Sideria achatana* and *Sciaphila nubilana*, with a large proportion of females of the latter.

S. rosæcolana, Dbld.—Not uncommon among wild and cultivated roses, and generally distributed. The imago appears in June and July, and may be distinguished from the following species, which it closely resembles, by its rounded costa, and also by its earlier appearance.

S. roborana, Treit.—Fairly common among roses. The imago seldom appears before August, when *S. rosæcolana* is over.

Pardia tripunctana, Fab.—Common everywhere.

Aspis Udmanniana, Linn.—Common throughout. It may be bred in plenty from shoots of bramble (*Rubus*), which the larva curls round and unites with the last leaf, making a very conspicuous bunch.

Sideria achatana, S. V.—Not uncommon among whitethorn; it appears to prefer hedges that are kept cut tolerably close. When beaten out it usually flies down or drops, and is more often to be found near the bottom of the hedge, whence the pupa may also be beaten. When bred the colours of this insect are very bright. It is commoner in Surrey than in the other two counties, but in neither is it scarce.

(To be continued.)

NOTES ON LEPIDOPTERA IN THE ISLE OF WIGHT, 1879.

BY RICHARD SOUTH.

THE months of May, June, July, and August were not more genial at Ventnor, in the Isle of Wight, than on the mainland; if anything, perhaps a little less so, the island being so much exposed to the prevailing south-west wind, which at times was icy cold. Again, fogs of a persistent character would cover the island for days together, rendering collecting not only poor in results, but decidedly unpleasant to the collector.

Many of the Diurni were late and scarce, notably *Anthocharis cardamines*, *Lycæna Adonis*, and *Polyommatus Phlæas*; of the last-named I only observed two specimens, and those not until the end of August.

Melitæa Cinxia was late, but fairly common, though difficult to obtain owing to wind and rain. All species of the genus *Satyrus*, with the exception of *S. Egeria*, were abundant. *Arge Galathea* and *Pyrameis cardui* were in large numbers.

Larvæ of *M. Cinxia* were plentiful from the 6th to 20th of May; a few were picked up both before and after these dates. They were observed in many localities between Sandown and Chale Bay, and at various elevations, some only a few feet from the sea, others on the steep sides of St. Boniface. Dull and even rainy weather seemed to be enjoyed by these larvæ, as on the few occasions when the sun was brightly shining they would be hidden under leaves, clods, &c. I had a striking example of this; for on one dull morning, with a strong wind blowing as usual from the south-west, I came upon quite a colony of these little black fellows busily engaged devouring various kinds of *Plantago*, not *P. maritima* only. Whilst I was securing a few a smart shower came on, but this did not disturb *Cinxia* in the least, though I was glad to hurry to the lee of an adjacent rock and take what shelter it could afford. Presently, the rain clearing off, I ventured from my retreat, and found the larvæ still exposed, with little beads of moisture on their spines, and all anxious to attain the summit of some stem or blade of grass, or other vantage point where they might dry their jackets. That process being accomplished they returned to their interrupted repast. Just then the sun shone forth with some power, and there was a general stampede, every

individual being now as desirous of concealment as a while ago it was to expose itself. The larvæ of *Arge Galathea*, *Vanessa Io*, and *Pyrameis cardui* were to be found in plenty.

Of the Nocturni I have nothing of interest to record, except perhaps the paucity of the imagines of *Zygæna filipendulæ* as compared with the host of larvæ seen in May and June. Neither have I much to say of the Geometræ; one or two species were to be had freely. Of these I may mention *Corycia tenerata*, *Melanippe galiata*, *M. procellata*, *Anticlea rubidata*, and *Phibalapteryx tersata*. *Abraxas grossulariata* was exceedingly abundant, and varied in marking from dull to pale, but with no very striking varieties. I also met with one specimen each of *Venusia cambricaria*, and *Lobophora viretata*.

Noctuæ were not in great force; many common species did not show up at all. I sugared posts, fences, bushes, and flowers on and about the downs, and now and then the trees in Pelham Woods, using some twenty-four pounds of "mixture," but I was not rewarded with a single insect worthy of note. *Thyatira derasa*, *Leucania pallens*, *Xylophasia sublustris*, *X. polyodon*, *Mamestra anceps*, *Miana strigilis*, *M. literosa*, *Agrotis exclamationis*, *A. corticea*, *Aplecta advena*, and *Hadena dentina* were the only things that came in any number. *Phytometra ænea* was not uncommon in the daytime, but *Acontia luctuosa* and the two *Euclididæ* very scarce.

Hypena proboscidalis, *Rivula sericealis*, and *Herminia tarsipennalis* were the only Deltoides that I met with. They were in some plenty. Of the Pyralites I took a fine series of each of the *Pyraustæ*, but only saw one *Ennychia anguinalis*; *Stenia punctalis* was very late and scarce; it did not put in an appearance till July 30th; the third week in August *Botys flavalis* began to come out freely; *B. fuscalis* was not common, although its food-plant grew in abundance, and I only obtained one poor example of *B. asinalis*. *Ebulea crocealis*, a fine series bred; larvæ very common. *Pionea stramentalis* was found rather plentifully in one or two little woods near Shanklin, and *Stenopteryx hybridalis* was abundant everywhere.

Of the Crambites, *Platytes cerussellus*, *Crambus pratellus*, *C. pascuellus*, *C. tristellus*, *C. geniculellus*, *C. culmellus*, and *C. chrysomuchellus* were all common, and I bred a fine series of *Ephestia cinerosella* and a few *Phycis ornatella*. *Oncocera ahenella* was not very scarce.

It was amongst the Tortrices that I found most employment. *Ænectra pilleriana*, though extremely local, was not uncommon (Entom. xii. 273). *Peronea hastiana*, a series bred from pupæ found in leaves and terminal shoots of osiers. *P. aspersana*, a series of very small and dark specimens were bred from *Poterium sanguisorba*, but, strange to say, not the round type, although these were common enough on the downs where I found the larvæ. *Penthina gentianana*, bred from teasle heads; and *P. sellana* was not scarce on the downs and at Steephill cone. *Aspis Udmanniana* bred, the larvæ very common in twisted shoots and packets of bramble leaves. *Sericoris littorana*, a series bred from flowers of *Armeria maritima*. *S. herbana*, specimens beaten out of a hedge in company with numbers of *S. lacunana*. *Euchromia purpurana*, not uncommon in rough fields; just before dusk is the best time to take this species, as they then get on the wing, but settle again before it is quite dark; a few may be turned up during the day, but in a field where they are known to occur a greater number may be taken by simply standing in one spot, at the right time, than could be obtained by tramping all over the field any other part of the day. *Orthotenia striana* very scarce. *Eriopsela fractifasciana* common; I took a long series of females. *Sphaleroptera ictericana* swarming. *Phoxopteryx comptana* fairly common, but, like everything else, late; there was a second brood in August. *Ephippiphora pflugiana*, unlike *E. brunnichiana* and *E. trigeminana*, was very scarce. A few *E. ephippiana* were bred from *Eupatorium cannabinum*. *Endopisa nigricana* very common, flying late in the afternoon over peas in fields; on one occasion I took thirty males in about as many minutes, as they came to a freshly-emerged female that was in a clump of grass at my feet. I afterwards secured the lady herself. *Stigmonota composana* scarce, but this may have been due to the wet and windy weather that existed when it was out. *Dicrorampha politana* occurred freely in one or two localities, and a few *D. sequana* with them. *D. petiverana* was common. *D. saturnana* plentiful, but local. *D. acuminatana*, a few along the upper cliff. *D. senectana*, common in several places along the foot of the downs. *D. simpliciana* amongst mugwort at Shanklin, and a long series of *D. consortana* bred from shoots of ox-eye daisy (*Chrysanthemum leucanthemum*). It is astonishing what rough treatment these larvæ can put up with. A number of the shoots were placed in a

tin canister at the time of gathering, brought home, and by chance put away in a corner where for some time they were forgotten. When I happened to come across the tin and opened it, I found a mass of vegetable matter in a very advanced stage of decomposition, and was about to throw the rubbish out, when I noticed a little pale brown pupa just peeping out of a web; so I threw all into a wooden box with a leno-net cover, and in course of time twenty-two imagines made their appearance, which were quite as fine as those more carefully attended to. *Pyrodes Rhediana* was common early in June, flying round hawthorn blossom in the sunshine, when there was any.

Catoptria cana, *C. fulvana*, and *C. Hohenwarthiana* were all common. Of *C. parvulana* I got two, and one *C. expallidana*. *C. pupillana* was scarce. *Eupæcilia atricapitana* was not often met with, but *E. hybridellana* was common and generally distributed, flying just before dusk. *E. rupicolana* was bred from hemp agrimony, and *E. roseana* from teasle heads. *E. ciliana* very scarce. A few examples of *Xanthosetia Zoegana* were taken. *X. hamana* and *Chrosis tessera* were very common. *Argyrolepia subbaumanniana* obtained in plenty on the slopes of the upper cliff, and *A. zephyrana* nearer the sea. *A. badiana* common among burdock. *Cochylis dilucidana* and *C. stramineana* were not scarce.

The *Pterophori* were represented by *Pterophorus ochrodactylus*, of which I took eight among yarrow. *P. trigonodactylus* not common. *P. acanthodactylus* abundant; larvæ and pupæ on rest-harrow. *P. parvidactylus* not scarce on the downs, but difficult to see and catch. *P. phæodactylus* very abundant. *P. Loewii*, a few on the slopes of the upper cliff, flying with *P. baliodactylus* and *P. pentadactylus*; the latter very common. *P. lithodactylus*, bred from larvæ on *Inula dysenterica*; these larvæ when young are to be found in the terminal shoots, but later on are difficult to obtain during the day; towards dark, however, they may easily be got, as they then feed exposed on the surface of the leaves. I could not find out where they hid in the daytime. *P. microdactylus*, one only; but *P. spilodactylus* was very common in the larval stage wherever any of its food-plant, *Marrubium vulgare*, was growing; the larva partakes of the colour and character of the plant, and, as it rests when not feeding on the upper side of the leaf and near its base, may readily be overlooked.

Judging the success of the whole campaign from a not unusual point of view,—the mere accumulation of specimens,—it certainly is not grand, but there is another phase of the matter; taking into consideration the abnormal season, and in consequence the few favourable opportunities for working, I am not inclined to be dissatisfied with the practical knowledge obtained of the habits of many species with which I was previously unacquainted.

In conclusion I will relate a curious circumstance that came under my observation on Sunday evening, August 10th. I was walking over Steephill Down, Ventnor, the light was fast declining, the air still and sultry, and a thunder-storm impending. I noticed, just over head, a moth soaring upwards; whilst watching it I became aware of others ascending in like manner, all towering in a spiral flight, and soon lost to view. On looking down I perceived others around me, starting from out of the furze; I made frantic efforts to secure a specimen so as to determine the species, but unfortunately, not having my net, I was unable to do so. I can only say that in size and shape they were not unlike *Plusia gamma*. I was at the time, and still am, unable to assign any cause for this unusual mounting to the upper air.

13, Bonchurch Villas, Ealing, Jan. 7, 1880.

LIFE-HISTORY OF *NOLA CENTONALIS*.

By W. H. TUGWELL.

On the 15th of August, 1879, I had the good fortune to capture two female *Nola centonalis* whilst collecting in Kent. As nothing was known of the life-history of this rare moth I risked spoiling my specimens by keeping them for eggs. Both deposited small batches, but only one lot proved fertile; these, thirty-six in number, soon showed signs of vitality.

When first deposited the ova were pearly white, beautifully striated, and somewhat hemispherical in form, i.e., convex above, flattened beneath. In two or three days a small dark central spot appeared, which increased in intensity till the time of hatching, which took place on August 27th. I had a difficult problem to solve, for I had no knowledge of the food-plant of the larvæ, so I collected portions of twelve different plants that grew about the locality of capture of the moths. These were enclosed in a wide-

mouth bottle with the eggs directly they commenced to hatch. Being so small, little or no signs of frass could be detected, and feared I had lost all, till the fourth day, when the contents of the bottle were carefully inspected on a sheet of white paper. I was pleased to find three different plants had been eaten. This gave hope, and enabled me to clear away a lot of useless plants. Carefully replacing the larvæ with fresh portions of their food, viz., *Potentilla anserina*, *Lotus corniculatus*, and *Trifolium procumbens*, I left them again four days, and then repeated the inspection. Now the preference for the *Leguminosæ* was decided, *Trifolium procumbens* being evidently the favourite food. I continued to give this plant for a short time, but finding it difficult to keep up a fresh supply, for I could not find it growing near Greenwich, substituted *Trifolium minus* and *Medicago lupulina*, both of which they ate freely. In their early stages they feed on the leaves only, but after the third and fourth moult I observed they had a taste for the flowers, so tried them with the heads of bloom of the common clover (*T. pratense*). They took most kindly to this food, and, being easily obtained, I continued with it till they spun up, which they did from first to second week in November. Doubtless this abnormal time of pupating was induced by being kept in a warmed room, and well supplied with fresh food. In nature they would undoubtedly hibernate. This is shown by six larvæ I had sent to Mr. Buckler. Although these were treated like mine, only in a cold room, after moulting five times they refused to feed up, and hibernated, as did two larvæ with me also. Luckily, by my forcing treatment, the risk of losing them in the state of hibernating was avoided, and enabled me to send a full-fed larva on to Mr. Buckler, and thus secured its portrait by his able pencil.

The young larvæ are a pale brownish yellow, hairy, and rather sluggish, a character they retained through life. If touched or irritated they drop from their food and curl themselves up, and remain thus for some time. They moulted five times at pretty regular intervals, viz.: first moult, on September 6th to 8th; second moult, 16th to 18th; third moult, 24th to 26th; fourth, October 12th to 14th; and the fifth and final was completed by October 26th. No great change of coloration takes place till the fourth change of skin, when a faint fulvous-yellow dorsal line first makes its appearance, and the fleshy tubercles are dark and spot-like. This last character is almost lost in the final moult.

The full-fed larva is, when extended, about half an inch to five-eighths of an inch long, moderately stout, somewhat thickest in the middle segments, attenuating slightly, both anteriorly and posteriorly. The head is small and dark blackish brown. The general ground colour is a translucent brown-pink. A narrow but well-defined yellow dorsal line, and on each of the segments, which are strongly developed, are six small fleshy tubercles, arranged in rows, three on either side of the dorsal line, and from which spring tufts of short brown hair. The spiracle line is not very apparent. The abdomen and claspers are nude, and of a translucent brown-pink shade.

When the larva is about to spin its cocoon it selects a grass-culm or other stem, and, having spun a little pad of silk on it, commences to nibble off portions of adjacent stems. With these it builds out two side pieces like an open boat, the grass-culm forming, as it were, the keel. It is most curious to watch this construction going on. The larva stretches itself out as far as it can reach without absolutely leaving hold of its work, in order to gather the building material, which it brings in, and adds, so to speak, another plank to its house. One larva, which had commenced its cocoon on the side of the bottle and not within reach of this necessary building material, spun the silk pad and very small wing or side pieces; then it appeared quite at loss how to proceed. I observed it thus for two entire days, but it could make no further progress with its work. I then placed some dried grass roots within its reach, and at once the building process went on, and the cocoon was completed. As soon as these side pieces are sufficiently developed, an operation which takes some thirty-six hours' labour, the larva commences at the bottom end to draw over the two edges so that they just meet, and spins them thus firmly together. Working in this manner steadily upward, until nearly closed in, the larva then enters the cocoon, draws over the top or head piece, and then lines the interior with silk. When completed it is both neat and compact, something like the cocoon of *Nola albulalis*, except that it is obtusely blunt at the top or head, whilst *N. albulalis* has it pointed at each end, like the *Zygænidæ*.

By keeping my pupæ in a warm room, the imagines commenced to appear on December 10th, and came out at intervals until December 28th, in all twenty perfect specimens. My treatment of them had been most successful, not losing a single one by death

The perfect insect varies very much indeed. The typical form is almost white, some pure white, without a mark on the wings save the button-like scales; others are grey, with a darker central grey band. Two or three have the usual lines of the superior wings, but no grey shading, the strongest marking generally being the line next to and parallel with the hind margin.

3, Lewisham Road, Greenwich, Jan. 1, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

REOCCURRENCE OF *CHRYSOPHANUS VIRGAUREA* IN ENGLAND.—

On August 26th, 1878, during my stay at Cromer, I had the good fortune to catch a female specimen of *Chrysophanus virgaurea*. At first I took it to be a variety of *Polyommatus phlæas*; and it was not till last Easter, when I saw the *C. virgaurea* figured in Mr. Kirby's 'European Butterflies and Moths,' that I had any idea what a prize I had secured. I was not able, however, to obtain any decisive judgment as to its true character, until I had the opportunity a few days ago of consulting Mr. C. O. Waterhouse, of the British Museum. After a careful examination Mr. Waterhouse pronounced it to be an undoubted female specimen of *Chrysophanus virgaurea*. Mr. Kirby says in his book that "although there seems little reason to doubt that it formerly inhabited this country, it has in all probability been long extinct." I am informed that since Doubleday's Catalogue of 1850 it has been altogether excluded from the lists of British butterflies.—C. H. CAPEL CURE; St. George's Rectory, 15, Grosvenor Street, W., December 31, 1879.

[The specimen above referred to, although a pale variety, is undoubtedly *Chrysophanus virgaurea*, and has the characteristic white line on the under side of the posterior wings well marked. CHAS. O. WATERHOUSE.]

LIFE-HISTORY OF *PERONEA PERMUTANA*.—Eggs laid in small patches on the leaves and stems of *Rosa spinosissima*, &c., in August and September. Larva amongst bound-together leaves of *Rosa spinosissima*, on which plant it feeds, generally feeding upon lateral shoots. In form it is slightly appressed, attenuate to anus from the 9th segment. Size three-eighths of an inch. The colour is dull yellowish drab, inclining to olive. Head bright, light-coloured, rather narrow; dorsal region rather darker than the general colour of the creature. Anal plate horn-like, bright;

spiracular region slightly puckered; anal spines large. The general appearance is a bright head and dull yellowish body. Pupa enclosed in a white silky web amongst the leaves; light-coloured at first, afterwards changing gradually to a dull dark brown; the larvæ feed in June, July, and into August; and the perfect insect appears in August, remaining in pupa from two to four weeks, according to the temperature of the season. In 1851 I took this insect at Barnes Common, but have never been there since until a few weeks ago. The locality appears so much altered that I should hardly expect to hear of *Peronia permutana* being ever taken there again. At Wallasey, in Cheshire, its original home, it is likely to remain for years, for its food-plant is spread over a large space of sand-hills. I also met with it at Penmanbach, near Conway, four years ago. Should the Wallasey sand-hills get built over, as is certain to be the case sometime or other, we, or rather those who follow us, must follow it to its mountain fastnesses at the entrance to the pass, from Bangor to Conway, on the Bangor old road.—C. S. GREGSON; Rose Bank, Fletcher Grove, Stanley, Liverpool, January 22, 1880.

TORTRIX ADJUNCTANA.—I thought everybody knew the history of our old friend once called *Tortrix Forsterana*; still it is refreshing and interesting to find the record so far back as Albin: his description of the larva is good. I have bred it from ivy a long time ago, and recently from ivy in our public park, and last season from bilberry (*Vaccinium myrtillus*); I have taken it on the heaths among bilberry for over thirty years. The specimens taken on the moors are very dark, rich coloured, fine examples. It is remarkable that many larvæ which feed upon bilberry are of a fine, rich, dark purplish tint. I have bred a great number of *Ypsipetes elutata* nearly black from this plant, in no way like those feeding upon the willow. The same applies to *Boarmia repandata*.—J. B. HODGRINSON; 15, Spring Bank, Preston, January 5, 1879.

CARPOCAPSA GROSSANA, REMARKABLE LENGTH OF LARVAL CONDITION.—During the autumn of 1877 I collected a quantity of the larvæ of *Carpocapsa grossana* feeding on the fruit of *Fagus sylvatica*, the common beech nuts. The larva is flesh-coloured, with black head and a number of spiracles. It is very lively, and when full-fed it leaves the nut in which it has fed, and seeks a suitable place in which to spin its cocoon. The cocoon is somewhat boat-shaped, tough, and hard. I placed some pieces of cork

and rotten wood in the cage, of which they very readily availed themselves. Some of the larvæ also spun up on the outside of the husks of the nuts. About the middle of June, 1878, the first imago made its appearance, and up to the second week in July I had not bred more than six specimens. No more appeared during the year, which I thought very strange, considering the number of cocoons I had. I placed the cage in the garden, exposed to the weather, thinking that some would lie in pupa until the following year, as many other species do. Some of the readers of the 'Entomologist' may remember there were no beech nuts in 1878. I visited localities in four different counties, but, strange to say, not a single nut could be found. I called the attention of some very observant entomological friends to the fact, who also never saw any beech fruit. Now, if the insects had all appeared, as is usual with many species, the species must have become extinct, or found some other food as a substitute, which is rather unlikely. In April, 1879, I was thinking of my *Grossana*, and upon opening a cocoon, instead of finding a pupa as I expected, I was surprised to find a larva as fresh as though it had not been there more than a few days, so I opened another with the same result; altogether I opened five, so thought I had destroyed enough. In less than two months from that time I bred thirty more specimens. There are many Tortrices which pass the winter in the larval state, as most of your readers know, but I never before knew of this insect remaining so long a larva. —D. PRATT; 398, Mile End Road, London, E.

REVIEW.

Index Entomologicus. Part I. Edited by Dr. F. KATTER.

London: West, Newman, & Co. 124 pp., fcap. 8vo.

To all corresponding entomologists the need of a special directory must often have been felt, and not unfrequently has the want of an address been the means of stopping many communications. Not long since the 'Entomologist's Annual' aimed at supplying this want amongst British entomologists. International communications are now more frequent, and let us hope will be; the 'Annual' is no longer published. Dr. Katter has just issued Part I. of the 'Index Entomologicus,' in which he attempts to give the addresses and specialities of all European entomologists, together with a list of entomological societies and periodicals.

Part II. will contain a catalogue of newly-described species. In this first list it is almost a necessity that there should be many errors both of omission and commission, and so it is, but their indication and correction is specially asked for by the editor.

The arrangement is not altogether of the clearest, for we certainly think it would have been preferable to have had a simple alphabetical list of the entomologists of each country, instead of the numerous divisions which are included, and which makes the search for an address, the geography of which may excusably be somewhat obscure to a foreigner, a matter of some difficulty. For instance, the entomologists of Germany are divided, first, amongst the respective twenty-six states in which their domicile happens to be; then, again, Prussian entomologists are subdivided amongst the ten old divisions of that country and so on; another distinction is made between those resident in the chief towns and otherwise, so that altogether we have to search through thirty-nine separate alphabetically arranged lists for an unknown German address; it is similar with other countries. British entomologists luckily are only divided into (1) London, (2) Liverpool, (3) rest of England, (4) Scotland, (5) Ireland, and we are sorry to see but three names in the latter division. On the other hand this division into districts is not without its advantages, since it enables the entomologist on his travels to find the names of his brethren of the science in the towns near which he is passing. The purpose of the 'Index Entomologicus' is excellent, but a better system of editing and the co-operation of entomologists generally is needed to make the present work the boon it would be, if perfect; let us hope such will be forthcoming. Anyhow, the thanks of British entomologists are due to Dr. Katter for his timely publication.—E. A. F.

EPHING FOREST AND COUNTY OF ESSEX NATURALISTS' FIELD CLUB.—This Society has been established to further the "Investigation of the Natural History, Geology, and Archæology of the county of Essex, and the publication of the results of such investigation," &c. We heartily wish the Club success; and with a little management we have no doubt it will fulfil the intentions of its promoters. Mr. R. Meldola, the president, and the honorary secretary, Mr. W. Cole, will forward any further information; the address of the latter is Laurel Cottage, Buckhurst Hill, Essex.—J. T. C.

THE ENTOMOLOGIST.

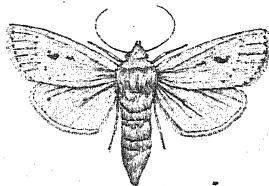
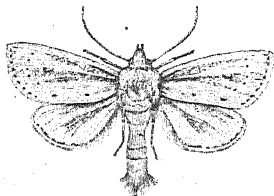
Vol. XIII.]

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[No. 202.]

NONAGRIA SPARGANII, *Esper.*

A NOCTUA NEW TO THE BRITISH FAUNA.



NONAGRIA SPARGANII.

To Mr. Sydney Webb, the discoverer of this handsome addition to the British fauna, I am indebted for the following particulars:—

In January, 1879, Mr. Webb exhibited a small specimen of a Noctua at the usual meeting of the scientific committee of the Royal Horticultural Society. The larva from which the first known British example of this lepidopteron was bred was of a bright yellowish green colour, and was found feeding in the stems of *Iris pseudo-acorus*. In confinement this larva fed well upon *Iris pumila*, and, in fact, upon any of the other dwarf forms of *Iris* now so much cultivated in gardens. A hint was thrown out at the meeting by Mr. Webb that the larva, of whatever species it was, might become a serious trouble to horticulturists on account of its voracious appetite.

He further stated that upon careful examination he believed the species to be *Nonagria sparganii*, but the example was so unlike any continental specimens that he deferred publishing an account of its advent until he had confirmed his opinion by

future observations. The botanic differences between *Iris* and *Sparganium* are so great that it was scarcely to be expected one insect would attack both plants.

It appears that the further discovery in the summer of 1879 of this larvæ was due rather to an accident than otherwise. Mr. Webb with Mr. W. R. Jeffrey were in search of Lepidoptera in one of the south-eastern counties on a wild gusty day in July last. Finding all the usual methods of collecting failed, these gentlemen turned their attention to the bored stems of the yellow flag (*Iris pseudo-acorus*). Mr. Webb had long noticed these borings in the wild *Iris*, but had hitherto failed to rear the larvæ. The result of the search in that instance was, however, the addition of this very fine species to the British list of Lepidoptera. The familiar green larvæ of the previous season was found last summer in bur-reed (*Sparganium ramosum*), also, thus confirming the species.

Those who have reared the larvæ of *Nonagria sparganii* have been beset with difficulties; one of the greatest is the very large quantity of food required by an individual larva before reaching the pupa condition. Probably the most convenient food is one of the dwarf garden varieties of the *Iris*, but when we remember that a very few larva will consume or waste more than all the plants usually found in a garden, it will be understood how much food may be required for a goodly batch. A further difficulty appears to be the facility with which the larvæ escape from confinement, especial care being necessary to see they do not get out of bounds, for their rambling habits make a search for the lost ones of little avail. Nor do the troubles end with the attainment of the pupa condition of this species. Mr. Webb states that upon emergence of the imago the fluids of the wings take so long to harden or dry, that many are injured both in confinement and in a state of nature. From twelve to forty-eight hours seem to be the normal time necessary for this process of hardening to be completed, and many moths have crippled wings in consequence. The majority of the moths appear to emerge between eight and nine o'clock p.m.; the flight extends from about six to seven in the evening in August and September, like that of *Nonagria fulva*. It can be imagined, therefore, that should the wings be not dry on the afternoon following the emergence from pupa, the moth, in its attempt to fly, loses much

of its beauty by the destruction of the ciliæ, or actual tearing of the wings by contact with the surrounding herbage.

The woodcut accompanying this article gives a better idea of the species than would a minute description of the perfect insect, but the following are the chief characteristics:—

The ground colour of *Nonagria sparganii* is a bone-coloured grey, paler along the veins, and with more or less reddish buff interspersed. The principal characters are seven dark dots within the ciliæ of the fore wings, and the shaded central line with its pale ocellus formed by the three or four black dots placed close together. The hind wings of the male have veins dusted with deep grey. There is considerable variation in the intensity of colour in a series of specimens, but the above are the leading features. The continental specimens are very much redder and otherwise differ from any of those as yet bred in Britain. It is a common species on the Continent of Europe, where it is said to feed chiefly on the reed-mace (*Typha latifolia*).

The proper place for this species in our collections is between *Nonagria cannae* and *N. typhae*, the imagines having some of the characters of both those species.

We are indebted to Mr. Sydney Webb for kindly lending the specimens, bred by himself, from which the figures are taken.

JOHN T. CARRINGTON.

Royal Aquarium, Westminster, January, 1880.

NOTES ON HYMENOPTERA.

By JOHN B. BRIDGMAN.

HYMENOPTERA, as might be expected from the very unfavourable season just passed (1879), have been unusually scarce in this neighbourhood, more especially the Aculeates. *Anthophora acervorum*, instead of swarming on every sunny bank in early spring, was very scarce. Willow blossoms were almost deserted instead of being alive with several species of *Andrena*; and, later in the season, the brambles, generally so attractive to bees, were almost as free from aculeate visitants as the spring flowers were. The only bee that really abounded was *Bombus virginialis*; these were unusually abundant. Several species of this genus I scarcely saw at all. Wasps were equally conspicuous by their

absence. The females of the common garden ant, which are generally met with crawling about everywhere in the middle of August, this past season were rarely to be seen. In spite of the unfavourable season I was fortunate enough to add three species of Fossores and one bee to my Norfolk list, viz., *Crabro podagricus*, *C. tibiale*, *Mimesa equestris*, and *Stelis phaeoptera*. Although I searched many times I could not find a single specimen of *Macropis labiata*, and the few Aculeates which were to be seen were all very late, as might be expected. On clearing out some of my boxes, &c., I found a male of *Tetramorium lippula*, one of our rarer British ants, which I had taken in the neighbourhood of this city in 1878, and had overlooked. Sawflies, generally speaking, were also scarce, but still *Nematus Ribesii* were a perfect pest, denuding the gooseberry bushes of their leaves. The unusual abundance of this insect has already been noticed in this magazine. Several other sawflies were plentiful in the autumn; I never before saw so many *Allantus tricinatus* and *A. scrophulariæ*. In the spring I took about half a dozen of that pretty little sawfly, *Eriocampa nigripes*, flying about the blackthorn.

In Mr. Marshall's 'Catalogue of Ichneumonidæ,' under *Cryptus carnifex*, he gives *C. elegans*, Desv., as a synonym; these are clearly two distinct species. Gravenhorst and Taschenberg did not know the male of *carnifex*. Thomson, in his 'Opuscula Entomologica,' fasc. 5, p. 513, describes both the sexes, under the name of *Hygrocryptus carnifex*, and gives *varicoxis*, Tasch., as the male; it may be so, but Thomson describes the male as having a red metathorax, which quite accords with the two males of *carnifex* I have taken, whilst Taschenberg makes no mention of any colour in this part. Thomson also describes another species of the same subgenus as *Drewseni*, which is evidently *elegans* of Desvignes. This latter name Thomson has given to a n. sp. of *Hoplocryptus*, another of his subgenera, and which name consequently ought to be altered. I have taken two males of another species of the same group of the genus *Cryptus* as *C. carnifex* and *C. elegans*, which I believe will prove to be the male of *C. palustris*, Thoms.; in *lib. cit.*, p. 514, he describes the female only, and says it is very like *carnifex*, but has the metathorax, coxæ, trochanters, and base of petiole black. The female has no white ring on the antennæ; the insect is a little smaller, which agrees exactly with my insects, adding that the third and

fourth joints of the hind tarsi are white, and one of them has the first segment entirely black. Amongst some Ichneumons, which Mr. Fitch kindly sent me to look over, I detected two of Holmgren's species of *Limneria*, whilst in my collection I found a third. The three together leave no doubt in my mind as to their identity: they are very similar in shape and colour, but differ from each other as follows:—all have the hinder femora black, and are about from one and a half to two lines long, and have a black abdomen.

A. Hind tibiæ whitish, base and apex blackish.

1. Aculeus about as long as the first segment of the abdomen.

L. lugubrina, Holm. Bred by Mr. Bignell.

2. Aculeus about half the length of the abdomen.

L. cursitans, Holm.

B. Hind tibiæ whitish, apex and before the base blackish.

Aculeus as long as *L. cursitans*, and antennæ shorter.

L. volubilis, Holm. Bred by Mr. Weston.

These are all new to the British list. I have also taken *Phygadeuon aberrans*, Tasch., which is like *P. abominator*, with a punctured abdomen; also a small species of the same genus, which I believe to be *P. nanus*, Grav.

The two following species of *Phygadeuon* I cannot find described in Taschenberg or Gravenhorst:—

P. Black; 2–5 joints of antennæ, abdomen from the 1st segment, femora, tibiæ, and tarsi red; extreme base and apex of hind tibiæ and hind tarsi dark; mesothorax coarsely punctured in the middle; metathorax shining, coarsely wrinkled; areæ very distinct; supero-medial, hexagonal much narrower in front than behind; 1st segment of the abdomen elongated; tubercles projecting and placed much behind the middle; from them it gradually widens, and is coarsely and distinctly long-wrinkled; remaining segments polished, 2nd very indistinctly long-wrinkled; abdomen elongate-ovate; transverse anal nervure divided less than one-third from the bottom; 1st joint of the flagellum about three times as long as thick; aculeus about one-sixth the length of the abdomen. Female. Length, 6·5 mill. Taken August 4th. Norwich.

The other species was sent to me by Mr. C. G. Barrett from Pembroke.

P. Black; abdomen from the 1st segment and legs chestnut;

base of coxæ, extreme base and apex of hind tibiæ and hind tarsi brownish; mesothorax punctured; metathorax punctured, and areæ distinct; supero-medial area almost semicircular; 1st and 2nd segments of the abdomen strongly and distinctly longitudinally striated; 1st segment slender, gradually tapering, with a slight depression in the centre, and tubercles scarcely projecting; transverse anal nervure divided much below the middle; aculeus about one-fourth the length of the abdomen. Female. Length, 5 mill.

I have met with several specimens of *Tryphon ephippium*, Holmgren. This species is readily distinguished by its smooth and shining metathorax, and is unrecorded by Mr. Marshall.

Mr. Fitch sent me, for examination, an *Ophion* with a yellow scutellum, which he thought different from *O. obscurum*. I was doubtful, but on its being sent to Dr. Kriechbaumer he identified it as certainly his *Ophion minutus* (described Ent. Nach., v. 105). It is, therefore, a species new to the British list; the specimen, a female, was captured by and received from Mr. Bignell. The neururation in Vollenhoven's figure ('Pinacographia,' pl. 39, fig. 1), is not correct.

Amongst my *Polyblasti* I detected three specimens of Holmgren's *Monoblastus lævigatus*. This genus is divided from *Polyblastus* by not having the clypeus separated from the face by an impressed line.

The pretty little *Perilissus pictilis*, Holm., figured in 'Pinacographia,' I have taken in this neighbourhood; also a small species which I cannot find in either Gravenhorst or Holmgren, and have, therefore, added the description:—

Black; abdomen from the 1st segment, legs, and antennæ beneath reddish ochre colour; apex of abdomen and 2nd segment sometimes clouded; coxæ, apex of hind tibiæ and tarsi brown; wings blackish brown and very dark; abdomen and face densely clothed with pale fulvous pubescence; antennæ about as long as the body; 1st segment subpetiolated; thorax smooth and shining; metathorax without area; areolet of wing oval and petiolated. Length about 5 mill.

This species has the wings unusually dark, and for that reason I would propose the name of *Perilissus fumatus* for it, should it be a new species.

Amongst some Ichneumonids collected by Mr. Billups was a

specimen of *Pimpla* I could not identify as belonging to any recorded British species. It appeared to me to answer best to Gravenhorst's *P. mandibularis*. Mr. Fitch has sent it to Dr. Kriechbaumer, who does not agree with this determination, but was not able to name it. It was then sent with some other Ichneumons, by Kriechbaumer's advice, to Herr C. G. A. Brischke, who says it most probably is *P. mandibularis*, and so for the present it must remain.

I bred from the cocoons of *Apanteles glomeratus* both sexes of *Hemiteles imbecillus*, Gr., by whom the male only is described, nor does Taschenberg describe the other sex. To their descriptions it only wants to be added "Aculeus of female half the length of the abdomen." I have a fine specimen of *Herpestomus* which I cannot find described:—2-4 segments of abdomen entirely red, remainder red-margined; antennæ reddish brown; flagellum paler at the base; legs red; apical half of hind femora and extreme apex of hind tibiæ dark; 1st segment of abdomen strongly and distinctly longitudinally striated. Length, 6 mill. Female. Taken in this neighbourhood.

I frequently take a *Pimpla*, which I believe is *P. detrita* of Holmgren; it is very distinct from any hitherto recorded British species. I have sent it to Dr. Capron; he thinks there is no doubt about the identification, and adds that he takes it commonly at Shere.

Norwich, December, 1879.

NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. SPILLER.

(Continued from p. 5.)

The genus *Junonia* is generally numerous in most tropical and subtropical countries of the Old World, and in Natal is represented by eleven or twelve species. The loveliest is the magnificent *Junonia Anacardii*, or mother-of-pearl butterfly. It is indeed a fine sight to see half a dozen of these splendid insects, in company with an equal number of *J. Archesia*, settled on the sausage-shaped flowers of the cabbage tree. The commonest species of this genus are *Enone* and *Clelia*, which are found everywhere in profusion. *J. Cloantha*, which inhabits

meadows, is almost equally abundant; this latter is orange-ochreous with purple reflections, and has on the hind wings a row of blue ocelli. *J. Ceryne* is not unlike our *V. urticae*; it is scarcer than the foregoing. I have taken a *Junonia* which is, I think, a variety of this, but the fore wings are rounded instead of angulated, and it possesses a common median transverse white band. *J. Natalica* inhabits woods, settling on the outer leaves of shrubs, and is not very common. *J. Amestris*, a fine black and blue species with a flight resembling the larger English *Vanessidae*, occurs most frequently in rough hilly districts. I have found stone-quarries abounding with loose stones the best places for them; they rest during the winter evenings underneath the stones, and by day they may be detected flying in the neighbourhood. On one occasion I remember thrusting my collecting-stick into a hole in a stone-quarry for the purpose of routing out any snake that might have taken refuge there, when out issued quite a number of *J. Amestris*. A quick stroke of the net secured four, but some half a dozen others must have escaped. *J. Pelasgis* and *J. Pelarga*, I think, are scarce; I have taken both species, but the latter species only twice.

Myrcelia Natalensis is a dark brown insect that seems particularly fond of settling with closed wings against the rough bark of trees. The cabbage tree is particularly favoured, and last April I noticed it by hundreds in such situations. A stroke against the trunk of the tree sent them flying in a perfect cloud.

Neptis Melicerta, a long narrow-winged black and white species, does not seem plentiful, since I have only once taken it, and, strange to say, it was in my own garden.

Diadema Misippus has already been referred to; it is tolerably common. Another of the same genus (*D. Dubia*), is scarcer. It has a lofty flight in woods.

Eight species of the genus *Nymphalis* have been recorded from Natal, to which must be added a large ochreous species taken at the Inanda by myself and Mr. Wood. This fine genus possesses many of the peculiarities of *Apatura*, being distinguished by a lofty rapid flight and a continual settling on trees and shrubs. *Nymphalis Xiphares* I have never had the pleasure of taking, but I have seen it on three occasions; one seen in January (1879) I should most probably have taken had it not in its flight led me from the wood into the high road into the midst

of some five hundred Kaffirs who were hastening to the Zulu war. Modesty prevented me favouring the "noble savage" with a specimen of the entomologist's art. *N. Xiphares* is a fine black insect with violet suffusions. *N. Ethalion* is a black species which, after a short but extremely rapid flight, settles on the edge of shrubs a dozen feet from the ground. By cautiously waiting, and then striking rapidly, I have managed to take a small series of this insect. *N. Brutus* is another rapid flyer that it is waste of time to chase; it expands nearly four inches, and its body is remarkably robust, whilst its wings are strong and firm; thus it is peculiarly fitted for a rapid flight. Here I find the twenty-foot pole handy, and by this means have taken several. *N. Zoolina*, a white *Nymphalis* with dark brown markings, I have captured several times settled on the leaves of the mimosa tree. *N. Neanthes* has the habits of *N. Ethalion*; on August 15th, 1879, however, I took a female resting on the ground. This latter insect is reddish ochreous in colour, with developed tails.

Philognoma Varanes is allied to *Nymphalis*; it is a common insect, but owing to its great size and strength of wing is a most awkward "customer" to catch.

Cylo Leda and *Gnophodes Parmeno* are not uncommon; the former flies by night, and comes to sugar like a *Noctua*. At the Inanda Hill, as previously mentioned, I captured a new *Debis*. The recorded species, *Dendrophilus*, I have never taken.

Ypthima Hebe, an insect like *Epinephile Tithonus* in habits and shape, is a feeble flyer, haunting dark corners of woods. It is however, very local, since I have only taken it in one locality of limited extent. *Mycalesis Eucus* and *Narcissus* are butterflies of the Ringlet pattern and habits; their mode of flight is an exact imitation of *E. Hyperanthus*. Like *Y. Hebe*, they haunt dark corners and are not common. They appear generally in March and April, and *M. Eucus* especially has beautifully ocellate spots on the under side. Both species reappear very sparingly indeed in August, but then, in all the specimens I have taken, I notice the under side plain without the "ringlets."

Eurytela Harbas is a very common butterfly in woods, flying after the fashion of *I. Sibylla*; another species, *E. Dryope*, with a yellow band, is scarcer. *Hypanis Ilithyia* is a most abundant butterfly, and appears in several forms, according, I presume, to degree of temperature prevailing. In summer the under side

is very light brown, in winter very dark umber-brown; in April and August the under side is intermediate in colour between these two extreme forms. The summer and winter forms of many of our butterflies are very different; the winter form of *Pieris Gidica* is especially interesting. Many of these forms have been dignified as species by closet entomologists.

The genus *Loxura* commences the *Lycenide*. *Loxura Alcides*, a stout swift butterfly with long tails, is of the most intense metallic-blue; the under side is of a chesnut-brown. Gardens are a favourite resort of this species, and the brilliant effect of its deep blue hue as it hovers over a flower may be imagined. Its flight is rapid, its wings apparently folded, and its long tail protrudes. *L. Dermaptera* I met with once in the public park at Durban; it is much more dusky in hue than its congener.

Myrina Pallene is a species allied to *Loxura*, and has a habit of resting on the leaves of trees, from whence it may be taken by the net.

Iolais Silas and *Sidus* are two exceedingly beautiful blue butterflies, ornamented with tails, *Sidus* especially being of a brilliant metallic-blue, almost as bright as *Loxura Alcides*. Both species appear generally distributed, *Silas* being apparently the more frequently met with. A favourite situation for *Sidus* is the bright orange flowers of a hedgerow plant called by colonists the "thick," and I have also taken it from the low boughs of trees. The female is far duller in tint than the male. The under side is white, with red "hair-streaks."

(To be continued.)

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By WALTER P. WESTON.

(Continued from p. 37.)

Sericoris euphorbiana, Zell.—Local, but not uncommon where it occurs. The larva is to be found in August and September feeding in the shoots of sea spurge (*Euphorbia paralias*), which it draws together: as soon as it is full fed it leaves the food-plant, and wanders away to pupate. The moth is to be met with in the following May, but is not nearly so common as in the earlier stage. It occurs at Folkestone.

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S. abscisana, Guen. = *fuligana*, Haw.—Another local species. The imago occurs in July and August, flying at dusk among common fleabane (*Inula dysenterica*), upon which the larva feeds, and should be sought for in May and June. Folkestone is the only locality where I have taken this species.

S. bifasciana, Haw.—Is to be met with in July and August flying at dusk round Scotch fir (*Pinus sylvestris*), and appears to be more widely distributed than either of the preceding species. It has occurred in Surrey, at West Wickham, Weybridge, and Mickleham; in Kent, at Darenth; and is included by Mr. C. G. Barrett in the list of species at Haslemere.

S. littoralis, Curt.—A very variable species as regards colour, but easily distinguished by its long narrow wings. It occurs along the sea-coast, banks of rivers, &c., among sea thrift (*Statice armeria*), and may be taken plentifully in June and July at dusk, flying with a short jerky flight. It has been bred by my friend Mr. Howard Vaughan, and others, from this plant. It occurs in Kent, along the banks of the Thames below Gravesend, and at Hythe; in Sussex it has been taken at Pett, near Hastings.

S. cespitana, Hub.—A very bright coloured but variable species, and generally abundant on chalk downs in July and August. The localities are Caterham, Mickleham, Darenth, Sevenoaks, Dover, Folkestone, &c.

S. conchana, Hub.—Rather local, frequenting damp places on heaths, broken ground, and open rides in woods. The imago is to be met with in July, and flies freely in the hot sunshine as well as at dusk. It has been taken at Darenth, near Strood, Tunbridge Wells, Folkestone, Mickleham, Tilgate Forest, &c.

S. lacunana, Dup.—Common everywhere. In some localities this species is liable to much variation, some examples being dark cinereous, or smoky black; others coal-black, with markings indicated by lustrous leaden hues. Mr. C. G. Barrett, in his Notes on British Tortrices (E. M. M., vol. xi., p. 28 *et seq.*), writes: "I have reared these dark varieties along with the typical form from screwed-up leaves of meadow-sweet (*Spiraea ulmaria*). They have been erroneously placed in some collections under the name of *herbana*." Mr. Barrett then gives his reasons why *S. herbana*, Gn., should be considered as a variety of this insect rather than a separate species; with which I think all who have met with *na* entirely concur.

S. urticana, Hub.—Common everywhere.

Roxana arcuana, Linn.—Not uncommon among oak bushes in May and June. It flies freely in the sunshine, and is widely distributed throughout these counties.

Euchromia purpurana, Haw.—Distributed but not common. The imago should be looked for towards the end of June and July among mixed herbage, on rough and broken ground.

Orthotenia antiquana, Hub.—Widely distributed, but not a common insect. The imago appears in June and July, and is to be found in similar situations to *E. purpurana*. In the E. M. M., vol. xv., p. 148, my friend, Mr. C. G. Barrett gives a most interesting account of rearing this species from the roots of the corn woundwort (*Stachys arvensis*), which he had collected in February.

O. ericetana, Bntl.—Distributed, and is to be met with in similar situations to *E. purpurana*, and occasionally in company with that insect, but it is not common.

O. striana, W. V.—Equally distributed as the preceding, but much commoner. The imago appears from the end of May to the end of June, and is usually met with at dusk flying slowly and for a short distance. The females are more often to be found at rest, with the aid of a lantern.

Eriopsela fractifasciana, Haw.—This species occurs commonly upon the chalk, and is double-brooded. The imagoes of the first brood appear about the middle of April; while the second brood, which is more plentiful, occurs in August and September. It is widely distributed, and may be met with in all suitable localities throughout these counties. It flies freely at dusk.

E. quadrana, Hub.—In similar situations to the preceding species, but somewhat later in the time of its appearance. It is to be taken on the wing at dusk, and is single-brooded. Its capture has been recorded from West Wickham and Darenth Wood, and has also been taken at Dover, Folkestone, Mickleham, Box Hill, and Lewes.

Phtheocroa rugosana, Hub.—Widely distributed, but not a common insect. It flies at dusk in May and June along hedges where the red-berried bryony (*Bryonia dioica*) occurs, and it would probably answer to search with a lantern for this insect at rest upon the leaves of this plant, in the berries of which its larva feeds.

Cnephasia cinctana, W. V.—This lovely little species ³⁶

present confined to Kent. It was first discovered by the Rev. S. C. Tress Beale in 1857, and was figured and described in the 'Annual' for the following year. After a lapse of several years it was again met with in plenty in the same county in 1878 and last year. The imago appears in July, but the earlier stages have not yet been discovered, so far as I am aware.

C. politana, Haw.=*lepidana*, Curt.—Not uncommon on moors and heathy places. The imago occurs from the end of April to June, and is on the wing during the afternoon sunshine. The larva feeds on sweet gale (*Myrica gale*), but is probably not confined to this plant. It occurs at Croydon, Weybridge, Tilgate Forest, near Tunbridge Wells, Uckfield, and Brighton.

C. musculana, Hub.—Abundant in all woods and country lanes in May and June. The imago flies at dusk, and is very strong on the wing; it also comes to sugar. The larva feeds on various trees, and also low plants.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

DIURNI IN IRELAND.—I think it may interest some of your readers to know that on the 3rd of October this year, in a wood near Carlow, Ireland, I saw a great many *Satyrus Elgeria* in good condition, and also one *Argynnis Aglaia*, apparently only just emerged from its pupa. *Vanessa cardui* was abundant in the vicinity of Dublin towards the end of September, but I saw only one *V. atalanta*.—G. DEWAR; 79, Thistle Grove, South Kensington, London, December 14, 1879.

SATYRUS JANIRA.—Referring to Mr. Slater's note in the 'Entomologist' (vol. xii., p. 295) that *Satyrus Janira* was not seen until July 18th, allow me to say that I saw one in a lane near the "Royal Oak," Finchley Road, Middlesex, in the afternoon of May 3rd.—W. T. HAY; 13, Park Road, Haverstock Hill, N.W., January 2, 1880.

SILK-PRODUCING AND OTHER EXOTIC BOMBYCES.—As the rearing of foreign Lepidoptera is gradually becoming more practised in this country, a few remarks on the successful productions of cocoons in the open air may be of interest to those whose efforts in this respect have not been attended with success. *Saturnia pyri*, the large emperor moth, is said not

to have been bred in the open air further north than Paris; nevertheless, having previously produced cocoons of this fine insect in a cool room of northern aspect, I determined to try the experiment, and, notwithstanding the past inclement summer, succeeded in obtaining several healthy fair-sized cocoons from larvæ fed on a plum tree (*Prunus domestica*). Great care, however, was necessary in the earlier stages to prevent the young larvæ from becoming a prey to spiders (Arachnidæ), and other predatory insects. *Attacus pernyi*, from Manchoooria, a northern division of China, and *Attacus cynthia*, from Northern China and India, I also succeeded in rearing in the open air on oak (*Quercus pedunculata*) and *Ailanthus glandulosa* (tree of heaven) respectively; but as these moths are of a hardier race than *S. pyri*, perhaps similar experiments with them by others have proved equally successful. With regard to *A. pernyi* it may not be irrelevant to state that a very praiseworthy effort was made some years ago by a gentleman residing in Colechester to acclimatise it, to which intent a number of impregnated females were liberated in a neighbouring wood on the north side of the town. The result, however, was not successful, though full-grown larvæ were subsequently beaten out of the oaks in the same wood. Two specimens of the moth, and probably others, appear to have been captured in the town about the time of the experiment, apparently attracted thither by the glare of the gas-lamps. Probably other Bombycæ, such as *Attacus Cecropia*, *A. Luna*,—a lovely apple-green swallow-tailed moth of queenly beauty, poetically styled by an American author “fair empress of the night,” in fanciful allusion to the name given by the Romans to the moon,—*A. polyphemus*, and *Saturnia Io* could, perhaps, during a warm summer, be likewise bred in the open air were fertile eggs obtained sufficiently early in the season to experiment with. I confess I have not been successful, either in or out of doors, in breeding these moths. *Attacus silene* from India, another splendid exotic Bombyx, much larger, lovelier, and more delicately plumaged than *A. Luna*, its American congener, is undoubtedly more entitled to the poetical designation before alluded to. I succeeded beyond expectation in rearing several magnificent larvæ of this truly grand insect on a walnut tree (*Juglans regia*) to the last moult, when a violent storm of wind and rain toward the end of August terminated their existence. This Bombyx polyvoltine or many-brooded, as observed by Monsieur A. Wa

in his notes on silk-producing Bombyces (Entom. xii. 10), and, therefore, no doubt offers a fairer chance of success to the experimentalist than many other foreign species; so that, under favourable circumstances, its cocoons should be formed early in September in this climate. *Attacus mylitta* from China and India (tussah-worm or moth), which produces a strong and valuable silk largely used for clothing in India, might probably, likewise, be reared in the open air in England, and, in the interest of science, I think the experiment worth attempting. I may mention that I have obtained cocoons of *Aglia tau*, the correlative of *Endromis versicolor*, from larvæ bred in the open air on oak. This insect, which can also be reared on beech (*Fagus sylvatica*) and other trees, is apparently not of difficult culture. From the foregoing remarks it would seem that European and Asiatic Lepidoptera are more easily reared in this changeable climate than those imported from America; such at least is my experience. Perhaps others more versed than I in this interesting and instructive study would, with the editor's permission, record their experience in the 'Entomologist.'—Geo. J. GRAPES; 2, Pownall Crescent, Colchester.

NOTE ON THE EGG STATE OF LEPIDOPTERA.—In the few books on Lepidoptera which I have consulted, although sometimes long and scientific descriptions are given of the insects when in their perfect state, little information is given on the larvæ, and still less on the state of the insects during the winter. They seldom say if the insect, during the winter, is in the egg, the larva, the pupa, or even the imago state. In the case of some species this is perfectly well known, but of many nothing is said on the subject. Again, when eggs of Lepidoptera are deposited during the autumn, will the larvæ always hatch of those species which are given and considered as passing the winter in the larval state? If these eggs be deposited too late in the autumn, or the weather be too cold, will not the hatching of these eggs (which in ordinary and mild weather would take place during the autumn), be delayed till the spring? I cannot answer this question in a general way through want of experience, but I can state a fact which may help towards the solution of the question. A few years ago I received from France, in the month of May, a quantity of larvæ of *Bombyx trifolii*. In due time I obtained the ones, the moths, the pairings, and a large quantity of fertile. These, instead of hatching during the autumn, only

hatched at the end of February, the larvæ having remained in the egg fully developed and in good condition during several months. I opened, during the winter, the *Trifolii* eggs, as I had previously done the *Yama-Mai*'s, to see the living larva in the egg. *B. trifolii*, however, like *B. quercus* and other species, is one of those given as hibernating in the larval state. As a matter of fact my *B. trifolii* were larvæ during the winter, but they were in and not out of the egg. Now, can this be called an accident, and is it not possible that eggs of other species, which generally hatch in the autumn in favourable weather, may be naturally retarded by cold till the following spring, or even longer, the larva remaining all the time fully developed in the egg?—ALFRED WAILLY; 110, Clapham Road, S.W.

EARLY NOCTUA.—On February 4th an imago of *Noctua plecta* emerged from a pupa dug at Oxford last November. The pupæ were in a cold room with north aspect.—J. WYAN THOMAS; 19, Cornhill Gardens, Queen's Gate, S.W., February 4, 1880.

EARLY MOTHS.—I was exceedingly surprised upon looking into one of my breeding-cages to find that a specimen of *Biston hirtaria*, as also one of *Orthosia lota*, had emerged from the pupæ. Is not this rather an unusual occurrence, and is the fact worth mentioning in the next issue of 'The Entomologist'? Perhaps some of your readers might account for the phenomenon.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., February 14, 1880.

EUCHELLIA JACOBÆ IN AUGUST.—While in Surrey last year, on August 4th, I captured three imagos of *E. jacobæ*, one of which was very fresh and seemed but recently to have emerged, and at the same time a number of larvæ of the same moth, some of which were nearly full grown. Were not the imagos very late?—P. F. ALEXANDER; Lower Heath, Hampstead, N.W.

NOTES ON THE PAST SEASON FROM WORCESTERSHIRE.—My first capture of any importance was a *Dasycampa rubiginea*, which I beat from sallow on April 1st in fair condition. During the first fortnight of the same month I took *Tæniocampa rubricosa*, *T. gracilis*, *T. populeti*, *T. leucographa*, and *T. opima*, but only a few of each; I believe the latter insect has not been before recorded from Worcestershire. I may mention that Mr. Edward of Malvern, has also taken it this season. Towards the end amidst

the month and at the beginning of May *Cidaria suffumata* and *Anticlea derivata* were more than usually abundant. I was much surprised on the 2nd of May to find a *Chesias obliquaria* out in the breeding-cage; I have never had it out before until the end of the month. During the second week in June *Thanaos Tages*, *Syrictthus alveolus*, *Euclidia glyphica*, *E. Mi.* and *Ephyra omicronaria* were swarming. On the 25th I captured *Leucophasia sinapis*, *Melitæa Artemis*, *Epione advenaria*, *Selenia lunaria*, *Asthena Blomeraria*, and *Procris Geryon*, all in good condition, and all very scarce, with the exception of *M. Artemis*. Mr. Edwards and I managed, however, to fill our boxes with *Minoa euphorbiata* and *E. omicronaria*, which flew from every bush. On the 30th of June I made an expedition after *Lycæna Arion*, meeting with eight; this is about a week earlier, I think, than the first recorded capture by a former correspondent this season. On the same day I found *Ephyra trilinearia* very common, but mostly worn. *Lycæna Argiolus* and *Thecla rubi* were also about, but in bad condition. *Platypteryx unguicula* completed my day's work. After the 11th of July *Timandra amataria* and *Cidaria dotata* were more than usually common, and towards the end of the month the same remark applies to *Cidaria pyraliata* and *Hemithea thymiaria*; on the other hand *Asthena sylvata*, *Nemoria viridata*, and *Acidalia imitaria*, never turned up at all. *Ligdia adustata* was common from May till the middle of August. As regards the Noctuæ the following, common in 1878, were almost, or entirely, absent:—*Cosmia diffinis*, *C. affinis*, *Agrotis saucia*, *A. suffusa*, *Noctua C-nigrum*, *Mania typica*, *Catocala nupta*, *Amphipyra tragopogonis*, &c. With the exception of *Mania maura* I found no Noctuæ plentiful. As an instance of the lateness of the season, I may state that on July 28th *T. Tages* and *Argynnis Euphrosyne* were still flying, *Satyrus Hyperanthus* was first out, and at the same time I captured a fresh specimen of *A. Blomeraria*; and on December 6th *Hybernia defoliaria* were still coming out in the breeding-cages.—[Rev.] E. C. DOBREE Fox; The Parsonage, Castle Morton, Worcestershire, December, 1879.

CAPTURES AT PLUMSTEAD, &c.—During the winter I searched for stems of *Stachys sylvatica* for larvæ of *Ephippiphora nigricostana*, and succeeded in finding about a dozen, which emerged in June last. At the end of May, among other larvæ, I met with *Geometra papilionaria* and *Phycis betulella* in the wood, and,

on the wing, *Macaria notata*, *Eupæcilia nana*, commonly; *Argyresthia conjugella*, plentifully; and a few specimens of *Cecophora subochreella* and *Aechmia dentella*. I also reared from larvæ found in this neighbourhood during the previous autumn a fine series of the pretty *Gelechia scriptella* from maple leaves; *Ornix betulævorella*, which was scarce, and *Lithocolletis ulmifoliella* in plenty from birch leaves. *L. corylella* was common, and *L. nicelliella* scarce from hazel leaves; *L. acerifoliella* in profusion from maple leaves; *L. schreberella* common from elm; *Antispila Treitschkiella* from dogwood: and eight of the rare *Coleophora fuscocuprella* from hazel.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, London, E.

TRIFURCULA ATRIFRONTILLA BRED.—In June last an insect emerged from one of my breeding jars which I did not know, and it unfortunately had so battered itself that recognition was difficult. Mr. Stainton, however, says that it is *Trifurcula atrifrontella*; and as nothing was in the jar except hawthorn leaves collected the previous autumn for larvæ of *Nepticulæ*, it appears certain that the larvæ of *T. atrifrontella* were feeding in the hawthorn at the same time. I remember noticing two or three blotch mines which then appeared distinct from *Nepticula perpygmæella* or *N. ignobilella*, but their number was so few that I thought it best to leave them with the others. The larvæ were collected in October, and it is likely that had they been looked for in the previous month more of the larvæ of *T. atrifrontella* would have been found. The time of emergence does not agree with that given in Stainton's 'Manual.'—J. H. THRELFALL; Preston, February 8, 1880.

NUMERICAL RELATIONS OF THE SEXES AMONG LEPIDOPTERA.—There has been some amount of discussion on the relative preponderance in number of the two sexes among moths and butterflies. The trade catalogue of European Macro-Lepidoptera, issued by Herr A. Kricheldorf, of Berlin, seems to throw some light upon this question. In no fewer than 177 cases the female is charged at a higher price than the male, whilst in only eight cases is the male the dearer. This surely proves that in a large majority of the cases where a notable sexual difference appears the female is, practically speaking, the rarer.—J. W. SLATER; 18, Wray Crescent, Tollington Park, N., January 21, 1880.

INSECTS AND THEIR FOOD-PLANTS.—It is singular with what instinct insects find out certain plants and shrubs not common in cultivation to feed on. I have, in my garden at Wotton-under-Edge, a fine old shrub of *Buddlea globosa*. This, when its beautiful globular orange-coloured blossoms are well out, is deliciously sweet with a strong honey-like perfume, and consequently very attractive to a great variety of insects both by day and night—Lepidoptera, Coleoptera, Hymenoptera, and Diptera in more or less abundance; and many an hour have I spent catching insects at it. Among the Coleoptera which were so attracted was the little *Cionus scrophulariæ*; it was always to be found diving its beak into the very centre of the flowers. Little did I dream how a little later on the young shoots and suckers, which spring abundantly round the old stock, would be so dreadfully disfigured by this insect, but there it was in the larva state in abundance. I had to make use of the knife very extensively to get rid of the pest and keep the shrub in a decent state. I believe this is the only shrub of the kind in the town, and being so centrally situate, and far removed from any pond or brook, it is certainly a marvel how the insect could have found it out in so different a situation to its usual habitat. The *Buddlea* is an American shrub belonging to the natural order Scrophulariaceæ, which includes the figworts of our pond banks, the ordinary food of this insect.—V. R. PERKINS; 54, Gloucester Street, S.W., December, 1879.

HYMENOPTEROUS PARASITES OF LEPIDOPTERA.—The following meagre list of parasites on various Lepidoptera is composed from materials which have lately passed through my hands. Its publication will be useful for future reference. The parasites were bred by the gentlemen whose names are attached, mostly in 1879. In many instances I am indebted either to Mr. Bridgman or Dr. Capron for the identification of the Ichneumonids:—

- Chasmodon notatorius*, F., from *Nonagria geminipuncta* (W. P. Weston).
- Ichneumon bilineatus*, Gmel., from *Bryophila glandifera* (G. C. Bignell).
- I. lineator*, F., from *Nonagria geminipuncta* (Weston).
- I. trilineatus*, Gmel., from *Abraxas grossulariata* (C. G. Barrett).
- Amblyteles Proteus*, Chr., from *Charocampa Elpenor* (Bignell).
- Trogus lutorius*, F., from *Smerinthus ocellatus* (E. A. F.), *S. populi* (E. A. F.), and *Sphinx ligustri* (Bignell).
- Phaogenes stimulator*, Gr., from *Yponomeuta padella* (E. A. Butler).

- Cryptus migrator*, F., from *Bombyx quercus* (E. A. F.).
C. tricolor, Gr., from *Simyra venosa* (T. Eedle).
Mesostenus obnoxius, Gr., from *Zygana filipendula* (Bignell and Weston).
Hemiteles similis, Gr., from *Lithocolletis spinicolella* (T. R. Billups).
Agrothereutes Hopei, Gr., from *Coleophora solitariella* (G. C. Champion).
Ophion obscurus, F., from *Dicranura vinula* (Eedle).
Anomalon xanthopus, Schr., from *Trachea piniperda* (J. B. Bridgman),
 and *Pieris Daplidice* (Bignell); pupa from Baklar, Turkey.
A. fibulator, Gr., from *Zygana filipendula* (Weston).
Paniscus testaceus, Gr., from *Dicranura vinula* (R. M. Sotheby and E. A. F.).
P. cephalotes, Holmgr., from *Dicranura vinula* (Eedle and Bridgman).
Campoplex pugillator, L., from *Notodonta ziczac* (E. A. F.).
Limneria albida, Gmel., from *Gonepteryx rhamni* (Bignell).
L. lugubrina, Holmgr., from *Cecophora flavimaculella* (Bignell).
L. transfuga, Gr., from *Scythropia crataegella* (E. A. F.); cocoons from
 W. Machin.
Cremastus sp.? from *Coleophora solitariella* (Champion).
Mesoleptus testaceus, F., from *Simyra venosa* (Eedle).
Echlytus ornatus, Holmgr., from *Tortrix heparana* (Bignell).
Pimpla instigator, F., from *Liparis salicis* (E. A. F.).
P. ruficollis, Gr., from *Retinia turionana* (Barrett).
P. diluta, Ratz., from *Pyrameis cardui* (Barrett).
P. graminellæ, Schr., from *Odonestis potatoria* (E. A. F.).
P. brevicornis, Gr., from *Eupithecia linariata* (Bignell).
Glypta bifoveolata, Gr., from *Dicrorampha simpliciana* (Weston).
Apanteles sp.? from *Vanessa Atalanta* (Bignell).
A. sp.? from *Satyrus Hyperanthus* (Butler).
A. sp.? from *Zygana filipendula* (Bignell).
A. sp.? from *Chelonia plantaginis* (Bignell).
A. sp.? from *Abraaxas grossulariata* (Bignell).
A. sp.? from ? *Catocala nupta* (Butler).
A. sp.? from *Lithocolletis lantanella* (Billups).
Microplitis ingrata, Hal.? from *Smerinthus ocellatus* (B. Brown).
Microgaster annulipes, Curt.? from *Euchelia Jacobæ* (Butler).
Peristenus sp.? from *Anarta Myrtilli* (Butler).
Macrocentrus linearis, Ns., from *Botys verticalis* (Bignell).
M. linearis, Ns., var. *pallipes*, Ns., from *Arctia caja* (Weston).
Pteromalus sp.? from *Saturnia carpini* (E. A. F.).
Copidosoma truncatellum, Dalm., from *Eupithecia absynthiata* (E. A. F.).
Entedon sp.? from *Lithocolletis pomifoliella* (Billups).
E. sp.? from *Lithocolletis faginella* (Billups).
Elachestus rufescens, Spin., from *Nepticula aurella* (Billups).
Eulophus sp.? from *Nepticula aurella* (Billups).
E. sp.? from *Lithocolletis pomifoliella* (Billups).

Several other bred specimens have been received, but either their determination is doubtful or the true host is uncertain; especially is this the case with certain Noctuæ.—EDWARD A. FITCH.

ZYGENA FILIPENDULÆ AND ITS PARASITES.—Mr. Fitch, in his note in the January number of the 'Entomologist,' under the head of "*Mesostenus obnoxius*," remarks that Rogenhofer had bred *Cryptus fumipennis*, Gr., from *Z. leta* (Entom. xii. 18). Two years ago we brought a number of cocoons of *Z. filipendulæ* from Wotton-under-Edge, and very shortly after most of the moths emerged; the cocoons, however, were left in the case untouched, when last season there appeared in the case eight specimens of *Cryptus fumipennis*, five males and three females. These parasites had remained in the pupa just twelve months. They were identified by Dr. Capron. Happy thought! never throw away unhatched, though old, cocoons.—V. R. PERKINS; 54, Gloucester Street, S.W., January 15, 1880.

SPIDERS IN 1879.—At page 289 of the 'Entomologist' (vol. xii.) Mr. Fitch quotes a few words from a paper by myself (Zool. 1861, p. 7553), relative to the effects of the wet season of 1860 upon spiders. The results of my observations during the past season (1879) fully bear out the opinion then offered, that excessive moisture is less hurtful to spiders than to insects in general. I should, however, like to add now a small qualification of that opinion, to this effect, that excessive moisture, combined with an unusually low temperature and absence of sunshine, is exceedingly hurtful to many spiders, but chiefly so to those whose life is passed among the coarser kinds of herbage, plants, bushes, and trees. Such spiders, embracing the *Epëirides*, *Theridiides* (genera *Linyphia* and *Theridion*), together with a large proportion of the *Thomisides*, *Lycosides*, and *Salticides*, have been as a rule very scarce during the whole past season. I have (on the contrary) found most of the species whose existence is passed among damp moss, at the roots of grass, rushes, and *débris* of all kinds, quite as plentiful as usual, even if not more so. These damp-loving spiders (principally of the genera *Neriène* and *Walckenaeria*) are, in general, exceedingly scarce after a dry, hot summer, when mosses and other short herbage, together with the whole surface of the soil, are parched and often completely roasted up. Most of the *Epëirides* have not only been very scarce during the past season, but many have been almost starved

from lack of insect food and want of sunshine, so that they have not attained anything like the dimensions reached in more genial seasons. In September, 1878, the beautiful *Epëira quadrata*, Clerck, was not only in profusion on our heaths, but many of the adult females measured eight, nine, and even ten lines in length. On the same spots during the past autumn this spider was comparatively scarce, and the largest adult female (out of many which I measured) did not exceed four lines, while some scarcely reached three lines in length. *Epëira adianta*, C. L. Koch (perhaps the handsomest of all our indigenous species), was, in respect to abundance, the only exception among the spiders of this family; instead of being scarcer than usual, this lovely (and usually scarce) spider was more abundant than I have ever before noticed it. The specimens were quite as large as usual, and not much later in coming to the adult state than in ordinary years. I cannot give any reason for this exception, more especially as the localities in which *Epëira adianta* occurs are about the most exposed parts of our heath district, and apparently little calculated to give any extra shelter or food in an unusually cold and tempestuous season.—[Rev.] O. P. CAMBRIDGE, Bloxworth, December, 30, 1879.

NATURAL INSECT TRAPS.—I can corroborate the Rev. O. P. Cambridge's statement respecting moths being found quite dead on the blooms of burdock. I have seen *Lithosia complanula* and *L. griseola* so more than once, and on two occasions have proceeded to box dead specimens of *Eremobia ochroleuca* from these heads; this was excusable, as this pretty moth is so frequently found resting by day on the blooms of *Centaurea nigra*. The causes of this singular mortality I had not traced. Burdock can scarcely be called an insectivorous plant, but Dr. Darwin's work on this subject merits greater attention than it has yet received from working entomologists. The why and the wherefore of these phenomena should be further enquired into. I was much interested in Messrs. Corbin and Druce's remarks on this subject (Entom. xi. 197, 233); this is now revived by Mr. Cambridge's note. These records are most interesting and suggestive, but my present communication leads in rather a different direction. I wish to call collectors' attention to certain natural insect traps occurring in the vegetable kingdom. The insects caught by the sundews and other "catchflies" are mostly

useless for cabinet specimens; not so the various Neuroptera, Hymenoptera, and Diptera, which are found drowned in the water which invariably collects in the basons formed by the connate leaves of teasel (*Dipsacus sylvestris*). Several genera of *Trichoptera* and *Tenthredinidæ*, especially *Dolerus*, are mostly well represented. It is by no means difficult to make these teasel insects into good cabinet specimens, either pinned or carded. Another trap, which seldom fails to yield a catch, is the flower-heads of various *Compositæ*. Amongst the closely laid florets of these flowers certain interesting Hymenoptera, especially *Proctotrupidæ* and *Chalcididæ*, and Coleoptera are frequently to be taken in abundance; to say nothing of the numerous Diptera. The gills of certain Fungi, especially the common mushroom and its allies, are sure to yield material to the student of the *Hymenoptera oxyura*, and these are often interspersed with the more minute Ichneumons and Chalcids, together with various Coleoptera and a few special Diptera. These insects are all engaged in the legitimate business of their lives, and are not there merely for shelter. I mention these, mostly overlooked, sources of material to the collector for two reasons. First, they will yield when insects at large are conspicuous by their absence; secondly, the species which commonly occur in these situations are but rarely taken in the usual way. Again, all entomologists are not active; health and habits interfere: all entomologists cannot always be equipped with nets and other paraphernalia for simple collecting; there are many circumstances which often interfere with this. But in the above-mentioned and similar natural traps we often find a true mine of entomological wealth, whose working is always convenient, and oftentimes especially productive. The lepidopterist and coleopterist will think these remarks foreign, but for them there is much yet to be learned in this direction. The coleopterist, we know, finds plenty of winter work among moss and *débris*; but surely when we learn that 900 specimens comprised, in thirty-four genera and forty species, were collected from only eleven examples of one plant, the usual tale from stubble and other hollow stems must appear small. This collection, together with numerous bugs, ants, spiders, &c., which are not specially specified, was made at Nice from the central cavities of eleven plants of *Glaucium luteum*, the end of December, 1876, by M. Peragallo. For the list of species see Bull. Soc. Ent.

Fr., 1877, p. clxxv. The yellow *Glaucium* is not uncommon on our coasts, but this instance is given as only, what should be, a sample of many. Their record would be a gain to others.—EDWARD A. FITCH; Maldon, Essex.

A FLOWER ATTRACTIVE TO INSECTS.—No flower seems to me more generally attractive to insects than the so-called African stonecrop. Its odour, though sweetish, is neither very fragrant nor very powerful, and its dull reddish colour does not to our eyes seem particularly striking; yet wherever they grow they seem preferred to all other flowers, not merely by butterflies, moths, and bees, but by many dipterous insects,—J. W. SLATER; 18, Wray Crescent, Tollington Park, N., January 21, 1880.

CERAMBYX MOSCHATUS.—Judging from my own experience I should say that not only do British specimens of *Cerambyx moschatus* vary from continental ones, as Mr. Slater points out (Entom. xii. 21), but that examples from different localities, even in our own country, are often very dissimilar in colour and size. When I lived at Alresford I used to find this beautiful beetle not at all uncommon; in fact I could take numbers any evening during the season by a bait which may be new to many. This was a lump of dough placed on the ground, or on the trees or hedges near an osier bed (*Salix viminalis*), which they frequented. These Alresford specimens were very large, and of a bright green, differing greatly from some examples sent me from Nottingham a short time since, which were of a bronze-green colour, and not a third the size. It is rather strange, seeing that there is no lack of the food-plant of the larvæ, that in this district the beetle seems quite unknown.—JOSEPH ANDERSON, jun., Chichester, January 6, 1880.

MONOHAMMUS SUTOR AT YORK.—I have a fine specimen of the rare beetle *Monohammus sutor* taken in a small garden near my house last summer (1879).—W. SIMMONS; 6, New Walk Terrace, York, January 20, 1880.

THE GLOW-WORM (Entom. xiii. 20).—The larva of this insect very much resembles the imago; it is also luminous, although in a less degree. These larvæ may be seen very late in the autumn, and again in the spring, long before the real glow-worms appear.—GEORGE R. WEBSDALE; 88, High Street, Barnstaple.

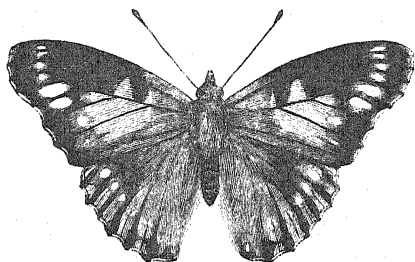
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[No. 208

VARIETY OF PYRAMEIS CARDUI.



PYRAMEIS CARDUI (variety).

THIS magnificent variety was bred on September 3rd, 1879, from a larva taken near the locks on the River Lea, at Clapton Park.

The ground colour of the wings is of the normal russet shade, but without the rosy blush on the costa of the fore wings; the whole of the hind margins of the fore wings are suffused with dark umber, almost black, in which the usual row of small white circular spots near the apex and the two costal white spots are replaced by white fusiform blotches, two abnormal white spots also making their appearance near the anal angle; the two large dark spots, which are usually on the disk between the median nervure and the inner margin, are altogether wanting. The hind wings are dark umber towards the base, and rust-coloured between the nervures from the centre of the wings to the hind margin, while between each of the nervures, which form broad streaks of black, are large white spots, forming a row parallel to the hind margin.

The markings are perfectly symmetrical on all the wings. The insect, which is in perfect condition, is a male, rather under the average size. Altogether the variety is one of the choicest I have ever met with in the course of many years entomological experience.

The woodcut at the head of this description has been carefully drawn by Mr. Horace Knight and engraved by Mr. Kirchner.

J. A. CLARK.

London Fields, Hackney.

LOCALITIES FOR BEGINNERS.

By JOHN T. CARRINGTON.

No. VI.—SEVENOAKS.

THE title of this article should rather have been Seal than Sevenoaks, but as the latter is usually the starting-point for entomologists I think it will be better known. As this treats, however, only of one side of the town, I shall probably, at a future time, return in another sketch to this district.

Sevenoaks is about twenty miles south-east of London, on the direct South Eastern Railway to Dover. Another way is by the London, Chatham and Dover line, but this is five miles longer. The neighbourhood of Sevenoaks peculiarly recommends itself to the entomologist. Surrounded on every side by either woods, commons, parks, or chalk downs, the collector has only to choose between the fauna inhabiting each kind of locality. The geological formation runs in bands of varying width from nearly east to west. Sevenoaks itself is upon the Folkestone Beds, while a couple of miles to the south we are upon the Weald Clay. Just past Seal, another couple of miles to the north of Sevenoaks, we are upon the Gault for a narrow strip; while still continuing north, we cross a very narrow bit of Upper Greensand, between the Gault and the great chalk range of hills beyond. It will thus be seen that the collector has the advantage not only of varied localities for collecting, but varied soils which produce a greater variety of plants than is to be found in most neighbourhoods. With Sevenoaks town we have little to do, in what I am now about to describe, for we leave that town to the right as we pass from the railway station.

The walk I propose to take, in imagination, with my reader, is probably one of the most interesting a naturalist could select in the London district. As we go along I shall point out the best places for the Lepidopterist to work at his leisure; for he could scarcely do more in one day than saunter through the walk without spending much time in filling his boxes with the treasures to be found. Again, I would remind my reader that he cannot take all the species I may mention at one time, for many appear at intervals wide apart. He must, however, try to remember when they are due, and having once seen the locality I think he will be only too glad of an excuse to revisit it.

Having arrived at the South Eastern Station in about an hour after leaving London, the visitor will see the Sennocke Hotel; we go to the right of it, passing the stable-gate, and up the hill through a plantation of Scotch fir, larch, and other trees. On each side of the road are close park palings. These should be examined for *Tephrosia crepuscularia* and *Penthina praelongana*. Both of these moths and many others occur at rest upon them. We follow the road until it is crossed by another, and we are opposite the "Bee-hive" coffee tavern, a new institution among some raw-looking new houses. Now turn to the left, and sharp again to the right up a narrow way, past the back of the "Bee-hive." Follow on to the old gas factory, which may be known by two iron retorts put upright in the ground, one on each side of the gate. Now keep down hill to the left, until the "Man of Kent" is reached, when, straight to the right, we pass in a short time through a small swing gate under three tall elms. This puts us on to the path leading through the cottage gardens allotments, and now we can go on without much further fear of being led astray.

As we pass along the path from the cottage gardens we notice the beautiful undulating country studded with woods on each side of us. Unfortunately these are, I believe, closed to the entomologist. Those trees to the right are in Wildernessee Park, where may also be seen the house which is the seat of the Camdens, but now occupied by Sir Charles Mills. Still following the path, we shortly cross the avenue leading to the house; then past a little patch of comfrey in the corner of a field, which is cultivated for cattle food. Here the gate leads into a lane; turning to the left, still we go forward, remembering that

Platypteryx hamula and *P. unguicula* have both been taken flying just here. At the end of this lane we cross the high road from the London, Chatham and Dover Station, leading to Seal. This is the Maidstone and Godstone high road; here there used to be a toll-gate, and the house still stands. Opposite we see a gate and a path leading up the hill. Following this we come to a hedgerow of old maples, ash, and oak. Many nice plants are here, the most common being dog's mercury (*Mercurialis perennis*), that harbinger of coming spring, and one of our earliest flowering plants, always welcome with its strings of little green flowers. *Ephyra omicronaria* may be beaten out, and *Cleora lichenaria* occurs on the lichen-covered tree trunks. On each side of us we now see that characteristic of Kent scenery,—the hop-pole plantation,—too thick to collect in comfortably, but good round the edges. Through the gate at the end of the path we come into a lane and turn to the left.

So far we have not passed any very important collecting place, but now we enter a really happy hunting ground. In this lane a man might spend a whole season, so rich is its fauna and flora. It would be almost less trouble to enumerate what does not, than what does, occur in this lane. *Vanessa Antiopa* has occurred; *V. polychloros* is common, as are all butterflies which are taken in such places. Of Geometers one is puzzled what to name; *Ephyra omicronaria*, *Scotosia undulata*, *Pericallia syringaria*, *Selidosema prunaria*, *Coremia quadrifasciaria*, *Cidaria silaceata*, *Lobophora polycommata*, *Selenia lunaria*, *S. illustraria*, and many others. Amongst the Pyrales, *Pionca stramentalis* is usually common. Tortrices are in abundance, and it is quite the home of Tineina. The sides of this lane are high hedge-banks with a great variety of shrubs and plants growing upon them. Amongst these are dogwood (*Cornus sanguinea*) in plenty, blackthorn (*Prunus communis*), maple (*Acer campestre*), hazel (*Corylus avellana*), various roses, beech, ash, willows, brambles, privet, wild strawberry, willow-herb (*Epilobium*), on which we should find larvæ of *Cidaria silaceata*, woodrush (*Luzula*), veitches with the larvæ of *Stigmonota perlepidana*, violets, primroses, woundwort (*Stachys sylvatica*), ladies' smock (*Cardamine pratensis*), bedstraws (*Galium*), and many of the Umbelliferae. On the stitchwort (*Stellaria*) are the cases of *Coleophora solitariella*. Here we may work and collect for hours without interruption.

The gipsies are fond of this corner; they are collecting too, but their booty is of another kind: they are after the dogwood, from which they make multitudes of butchers' skewers.

Still working on, we come to the railway bridge. Standing upon it we look to the left and see the Sevenoaks racecourse. This looks a likely place for *Pyrales*, *Tortrices*, and *Tineina*. On the right of the bridge are some nice railway banks, which are especially inviting for the *Eupæciliæ*, &c., on a sunny evening in June. Turning our faces from whence we have come, we see our road winding on and up to the chalk hills opposite, and for these we start. Just past the bridge is a cottage, and a little before reaching it we cross a little stream; here we may drink,—for the water is always good and the stream is never dry,—as we shall probably see none other for a long time. In the hedge bottom, a few yards past, grow a number of plants of hemp agrimony (*Eupatorium cannabinum*). This is not by any means a common plant in the district. On the seed of this plant may be found the larvæ of *Eupithecia coronata*. I used to wonder where this insect fed in districts where there was no clematis until I found this pabulum.

It is about here we enter on the chalk, and may expect the chalk insects; but although it is still a good collecting ground we push on to the hill-side, and for the big chalk-pit we see in the distance. On the way, however, our attention is arrested by the great stalks of flowers of the Canterbury bell (*Campanula latifolia*). In these bells may be found the larvæ of the somewhat rare pug, *Eupithecia campanulata*. At the top of the lane it is crossed by a high road, known I believe as the "Pilgrims' Road," but in olden times more used by smugglers than by pilgrims. Crossing this we see some old yew trees (*Taxus baccata*). From these we should get *Boarmia abietaria* and *Lithosia helveola*. Shortly after this, entering an open place, we find quite an entomologist's paradise. The slopes from the wood above the chalk-pit are covered with chalk-hill plants in profusion: cowslips (*Primula veris*), and these such large ones; wild thyme (*Thymus serpyllum*), marjoram (*Origanum vulgare*), St. John's worts (*Hypericum*), junipers (*Juniperus communis*), stunted blackthorns, viper's bugloss (*Echium vulgare*), orchids, many species; wood spurge (*Euphorbia amygdaloides*), willows, wood sage (*Teucrium*

scorodonia), and so many others that one would want to well nigh exhaust a Kentish flora to name them all.

In this chalk-pit and on the slopes one may spend many a long and profitable day. Here is quite a home of the blues, *Lycæna Adonis*, *L. Alsus*, *L. Corydon*, being frequently very common, as is also *Arge Galathea*, with four of the skippers (*Hesperiidæ*). *Acontia luctuosa* is often very abundant, with *Euclidia glyphica* and *E. mi.* Many Geometers are here, as also some good Pyrales and knothorns (*Phycidæ*). Many rare Tortrices have been taken here, and Tineæ are in abundance.

By the side of the road leading up to the wood, and also at the foot of the slopes, are fine tall old hedges covered with great masses of travellers' joy (*Clematis vitalba*). In these hedges grow large quantities of the mealy guelder rose (*Viburnum lantana*), mixed with blackthorn, roses, brambles, and yew trees. Out of these many species of Lepidoptera may be disturbed with the beating-stick; one of the most common is *Venilia maculata*, amongst the specimens of which good varieties have been taken; these should again be looked for. I believe most varieties in Lepidoptera are hereditary, and may be found year after year in the same locality. If it be growing dusk we may frequently fill our remaining empty boxes with the very beautiful *Ilithyia carnella*, which is often very common on the slopes.

One gets tired eventually of even such a place as this, with its beautiful views of the country to the south, and must seek refreshment, and try fields afar for other species. We will, therefore, return by the lane again on to the Pilgrim's Road: turning to the left we pass two or three old yew trees; these are quite landmarks. They have been cut into one of the stupid shapes which was the fashion of our forefathers, who are now quoted as having had such strict views of art; but if cutting a naturally handsome tree to resemble some bird or beast was æsthetic, I am glad we are no longer so. Taking our way forward we turn to the right, down the first road we see, and we come to the quaint village of Kemsing, surrounded by hop gardens: here we find the "Bell Inn," and may rest for a time. In the middle of this village are two potent springs: these are said to supply the source of the River Dart, which joins the Thames at Dartford. There is a charm on a hot day in looking at this clear running water; and when we think of old friends who have joined us in

such a ramble as we have had to-day, and who are now no more, we are reminded of the words in Tennyson's poem, "The Brook :"—

"For men may come, and men may go;
But I go on for ever;"

Leaving Kemsing we make our way to the south for Seal Chart. Again crossing the railway we leave a likely-looking wood to our left, and follow the right-hand road. This brings us to a farmhouse, amidst more hop gardens; by the farmhouse is a guide-post, and we take our way to the left. There are some old elms by the farm wall, and at their feet is a fine bed of ground ivy (*Nepeta glechoma*); on this we should find the cases of *Coleophora albitarsella*. On the roadside, a little further on, are some hollies, where several varieties of *Lycæna argiolus* have been taken.

Seal Chart is a fine fir wood of many acres in extent; perhaps a couple of miles long. To the entomologist it has the charm of being free. The trees are chiefly Scotch fir (*Pinus sylvestris*), buckthorn (*Rhamnus frangula*), oak (*Quercus robur*), birch (*Betula alba*), hollies (*Ilex aquifolium*), junipers (*Juniperus communis*), &c. The undergrowth is of heather (*Calluna vulgaris*), bilberry (*Vaccinium myrtillus*), golden-rod (*Solidago virgaurea*), &c. Just as we come up to the wood from Kemsing are high banks on each side of the road; these should be very carefully examined for the larvæ of *Cucullia asteris* and *C. gnaphalii*. They have been several times found here, as well as in the wood, feeding on the golden-rod. We keep straight on the Ightham Road, which leads us through the wood, until we come to Mr. George Saxby's brick-yard; here we turn sharp round to the right on our road to Seal. If we have a favourable day, with time to spare, we may always make a good bag in the Chart. Of course we get the fir-feeding species, such as *Ellopiæ fasciaria*, *Trachea piniperda*, *Thera firmata*, and *T. variata*, with several Tortrices and Tineina. From the bilberries we get *Scotosia undulata*, *Coccyx vacciniana*, *Penthina sauciana*, the latter sparingly, &c. Amongst the other moths we are likely to get are *Tephrosia crepuscularia*, *Boarmia consortaria*, *B. roboraria*, *Epione advenaria*, *Hypena crassalis*, usually common; *Stauropus fagi*, *Geometra papilionaria*, *Agrotis agathina*, *Noctua neglecta*, *Dipterygia pinastri*, *Cymatophora flavicornis*, *Notodonta dictæa*, *N. dictæoides*, and *N. carmelita*; while *Dicranura*

bicuspis and *Phoxopteryx siculana* have been taken, both in the Chart and in Wildernesse Park. All these, and many others, inhabit this wood, and should be taken in their respective seasons.

Leaving Mr. Saxby's corner for the village of Seal we come upon a fine old fence; this fence is often a great consolation to the entomologist on a windy day, and should at all times be looked over: it encloses Wildernesse Park, which is not open to the collector. Many good moths have been found upon these palings: we hear of ten *Cymatophora fluctuosa* in one day; *Notodonta chaonia*, *N. dodonea*, *N. trepida*, *Stauropus fagi*, *Boarmia roboraria*, *B. consortaria*, *Cleora lichenaria*, *Phycis abietella*, *Chrosis Audouinana*, *Carpocapsa grossana*, *Stigmonota puncticostana*, *S. Weirana*, *Coccyx splendidulana*, *Catoptria Juliana*, &c.

In a short time, on going down the road, we come up to Mr. R. White's "Yeoman Inn," in Seal, and I have no doubt we shall only be too glad to avail ourselves of a rest. Another mile's walk and we reach the "Bat-and-Ball" Station of the Chatham and Dover Railway, whence we may return to town; or by the Tub's Hill Station, to which we came.

I think I have sketched the locality for the reader in such a manner that he has but to loiter to be happy. What I have missed or not told him, he will have the pleasure of finding for himself; neither have I treated of the many woods and heaths on the other side of Sevenoaks: that is but a pleasure deferred.

As I said at the commencement, Seal ought to have been the title of this article: it is the natural headquarters for all the places I have described, and within an easy walk of any of them.

I have to thank Mr. Eedle for kindly giving me the value of his experience of some twenty years, during which he has collected over this ground.

Royal Aquarium, Westminster, March, 1880.

NOTES ON THE RHOPALOCERA OF NATAL.

By A. J. SPILLER.

(Concluded from p. 58.)

Amblypodia is a genus allied to the European *Thecla*, and is represented by some four species, the largest and handsomest of

which is *A. Natalensis*, which I generally take resting on flowers. *A. Erylus* and *Leroma* are two species tolerably common that possess the habits of the English *Theclæ*, as they may be easily shaken from trees and bushes. *A. Hirundo* is a singular species, of a dark ash-grey colour, with long twisted tails to hind wings. It is found hovering over bushes, and has a rapid but jerking flight, its wings during that operation being partially closed and tails protruded.

Of the genus *Lycæna* twenty-four species inhabit South Africa according to Trimen, but the number must be very incomplete, as here, at Verulam, I have taken twenty-one distinct species, some six or eight of which I am quite unable to determine. Talking to a Natal entomologist a few days ago, I asked him why it was the small butterflies were so little known. In reply he told me that owing to the difficulty of getting proper entomological pins many collectors simply ignored the small butterflies. It would indeed be a waste of time to catch, say, the little *L. Lysimon*, measuring about eight lines, and then try to impale it on one of those pins known to entomologists as "pokers." The *Lycænæ* are most abundant in January, February, and March; during winter only some half-dozen species may be met with. The largest of Natal Blues is *L. Celæus*, an insect not unlike *L. Arion* in shape and habits; the colouring of the male is bright violet-blue; of the female there are two types, one being tinged with blue, the other quite brown. *Celæus* is plentiful in January. Some eight or nine species of Blues frequent bushes, more especially in January, and a couple of blows to a tree, with corresponding sweeps of the net, should take at least a dozen specimens. During winter a black *Lycæna*, spotted with white, is met with on bushes locally near Verulam; the species may be new, as it is unknown to all entomologists in Natal with whom I have conversed. Several species of the *Ægon* type, but a little smaller, are found in grassy places; another, almost exactly like *Alsus*, is found sparingly, whilst two or three species, only not much more than half the size of *Alsus*, are found in December and January. *L. Bætica* is common, but has never, to my knowledge, occurred in swarms. On the wing it resembles *L. Alexis*, and is found principally in the neighbourhood of papilionaceous plants. It is a quick flyer.

Chrysophanus Orus I have once seen flying on a piece of waste

land near Verulam. The genus *Zeritis* is allied to *Chrysophanus*, but although twelve species have been recorded from South Africa I have never been fortunate to meet with more than two in Natal. *Z. Chrysaor*, a butterfly of a glittering golden tint, I have taken twice at rest on tall shrubs. The other species, *Z. Perion*, is very common in summer, and may be taken with the finger and thumb at rest on the tops of flowers. This genus seems commoner in Cape Colony than here; at Cape Town on December 1st, 1878, I took several *Z. Zeuxo* on the hills around the town.

Pentila Tropicalis is a singular butterfly, of a gamboge-yellow tint speckled with black. Its flight is very weak, and curiously resembles a *Geometra*. When I first saw this species I imagined it was a *Geometra* fluttering in the bushes. Another *Pentila* has been discovered here within the last few years; it is much smaller than *Tropicalis*, and has a brisker flight. It is strange it was overlooked so long, since I found it close to Durban.

The Skippers number probably some forty species here; twenty species have fallen to my net. Some few bear a striking resemblance to the English *Alveolus*; one resembles *H. Comma*, only that it is much darker. Another, in the male, is not unlike *Actæon*; whilst a fourth, a black Skipper, in habits and contour resembles *Linea*. The loveliest of the Skippers, I think, is *Caprona Canopus*, a blossom-like insect with snowy wings tipped with ochreous. Unlike the English Skippers, it delights to sun itself on leaves of trees. Another Skipper of the same habits is *Cyclopides Metis*, a dark brown butterfly spotted with orange yellow. This is also a handsome insect, and is a true wood-butterfly, being taken at rest on the leaves of bushes in sunny openings in woods. It is plentiful at Inanda Woods, and I have taken two or three near Verulam. Several species allied to *T. Tages* occur, but they are all much larger, and not so "dingy;" one of the finest is *N. Ophion*, distinguished by the bluish white tint of the under side of the hind wings. The largest Skippers are comprised in the genus *Ismene*, the commonest being *I. Florestan*, a butterfly with a white patch on the under side of the hind wings. The three species of this genus are all rapid flyers, darting with extreme rapidity from flower to flower.

The moths of Natal are exceedingly numerous, the Bombyces being especially well represented. As soon as the shades of evening set in the tubular flowers are beset by a dozen species of

hawk-moths, amongst them *S. Convolvuli* and *S. Celerio* being frequently, and *C. Nerii* rarely, taken. *A. Atropos* is common on walls, and the following English species occur:—*D. pulchella*, *S. saccharia*, and *Heliothis armigera*. Few of the butterflies or moths of Europe are to be found in Natal. This is to be accounted for by the isolated character of Africa as compared with Europe and Asia, and the presence of the great deserts, which act as barriers to insect migration. During the remainder of my residence in Natal I intend devoting much spare time to the study of the moths, the several hundred species I have already secured being very interesting.

Collecting here is very different from what it is in England. One has to be careful of not treading on snakes; this, however, I have done several times. And as for animal life, I have met with a leopard, bushbucks, iguanas, monkeys, crocodiles, pythons, imambas, puff-adders, &c., in my rambles. However, with a couple of loaded revolvers in my pockets, I never feel alarm, although one large forest on the coast is noted for its leopards.

PS.—Since writing the above I have met with the following butterflies more or less plentifully:—*Neptis Melicerta*, *Athyma Saclava*, *Pyrameis Hippomene*, and *Junonia Pelarga*. I have also captured a hermaphrodite specimen of *Anthocharis Antevippe*, the right wings being male, the left pair female.

Verulam, Natal, August 31, 1879.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 61.)

Sciaphila nubilana, Hub.—Common everywhere in June and July, flying at dusk over whitethorn (*Cratægus oxyacantha*). The larvæ feed in the shoots, and the pupæ may be obtained by beating into an umbrella about the middle of May.

S. perterana, Guen.—Widely distributed, but local. It seems confined to chalk and limestone soils, and is much commoner by the sea-shore than inland. The imago appears in June and July; the larvæ are to be found in May and June feeding in the blossoms of *Chrysanthemum*, *Hieracium*, and other *Compositæ*. Their presence may be noticed by the flower-rays being carefully turned down

as to form a covering. It occurs at Sanderstead, Croydon, Box Hill, Darenth, Hastings, Folkestone, &c.

S. subjectana, Guen.—Generally abundant everywhere in June and July.

S. virgaureana, Treit.—Not so common as the previous species, but widely distributed. The larva is a polyphagous feeder in May and June; the imago appears in June and July.

S. chrysanthæana, Dup. = *Alternana*, W. V.—Distributed, but not common. The larvæ feed in the ox-eyed daisy, and would probably be met with on other *Compositæ*. The imago appears in June and July.

S. communana^{hasturana}, H.-S.—Distributed, but not common. This species is longer in the wing than *Subjectana*, and of a unicolorous brownish black colour. It is to be met with in June and July, flying over various mixed herbage, and is partial to railway slopes. Though frequently met with in company of the three previous species, the unicolorous hue of its wings, together with their longer shape, easily separate it from them.

S. pasivana, Hub. # *sinuana*, Steph.—A local and rare species. Mr. C. G. Barrett, to whose kindness I am indebted for much valuable information, especially in this group, informs me that he has seen only one specimen from these counties, which was captured by the Rev. E. N. Bloomfield, near Hastings. The capture of specimens under this name has also been recorded from Darenth and West Wickham.

S. hybridana, Hub.—Widely distributed and not uncommon in whitethorn hedges. The imago appears in June and July, and is sluggish in its movements. The female is much smaller than the male, and might be mistaken for another species. I have occasionally bred this species from pupæ beaten from whitethorn in May.

Sphaleroptera ictericana, Haw.—Widely distributed and common. The larva feeds on the ox-eyed daisy (*Chrysanthemum leucanthemum*), and many other low plants in May. The male may be taken abundantly at dusk, in June, flying over mixed herbage, while the female is seldom taken on the wing, but may be found at rest towards the end of the month on palings, &c. I have found them abundantly on the trunks of pollard willows.

Capnia ochraceana, Steph.—Distributed, and not uncommon in

May and June among hornbeam (*Carpinus betulus*), upon which the larva is said to feed.

Clepsis rusticana, Treit.—Local and not uncommon. The imago occurs in May and June, flying over grassy slopes and damp places in woods. Messrs. Howard Vaughan and Sydney Webb met with it once commonly at Tilgate Forest flying in the afternoon sunshine.

Bactra lanceolana, Hub.—Abundant in all damp and marshy localities from May to September. It is a very variable insect, especially in size, the largest specimens appearing about mid-summer. The larva feeds in the stems of the common rush (*Juncus conglomeratus*).

B. furfurana, Haw.—Local and not common. The imago appears in June and July, and occurs among rushes at Folkestone and other places in Kent, and a single specimen was taken at light near Hastings.

Phoxopteryx siculana, Hub.—Distributed, but not common. The imago occurs in May and June among narrow-leaved buckthorn (*Rhamnus frangula*), and the larva should be looked for on this shrub. It has occurred at Darenth, West Wickham, and Birch Woods; Croydon and Wimbledon; Tilgate Forest, Haslemere, Hastings, &c.

P. uncana, Hub.—Distributed throughout in heathy places. The larva is said to feed on heath (*Calluna*), but I once met with the imago very abundantly flying among some small birch bushes and dwarf sallows, on the leaves of which they were frequently observed to settle. There was no heath near. The localities are Croydon, Wimbledon, Weybridge, Ashstead, Coombe and West Wickham Woods; Tilgate Forest, Hastings, Haslemere; Tunbridge Wells, and Darenth Wood.

P. biarcuana, Steph.—Local and not common. The imago occurs in June and July among dwarf sallows on moors and heathy places. It has been taken at Haslemere, Tilgate Forest; Wimbledon, Weybridge; Darenth, and Tunbridge Wells.

P. inornatana, H.-S. = *subarcuana*, Wilk.—Commoner and more generally distributed throughout these counties than the preceding species. It is double-brooded, the imagos appearing in the spring, sometimes as early as April, and again in September. The spring brood is the more plentiful. It occurs at Weybridge, Wimbledon, Darenth, Tunbridge Wells, and near Uckfield.

P. comptana, Frol.—Abundant on all chalk downs. There are two broods in the year, the first appearing in April and May, and the second in August and September. From its small size and short jerky flight it requires a good eye to detect it, and it is not easy to capture. The larva is said to feed between the leaves of *Potentilla*.

P. myrtillana, Treit.—Local and not common in these counties. The imago appears in June; the males may be taken towards sunset flying over bilberry (*Vaccinium myrtillus*); the females at rest on the same plant. It occurs near Haslemere; on the White Hills, near Caterham; and at Sevenoaks.

P. lundana, Fab.—Common and widely distributed throughout. It is double-brooded, occurring in May and again in August, and is a free flier. The larva feeds between united leaves of the bush vetch (*Vicia sepium*), and the meadow vetchling (*Lathyrus pratensis*).

P. derasana, Hub.—Local, but not uncommon where it occurs. The imago appears in June and July, and occurs in the lanes round Croham-Hurst, Surrey; at Haslemere, Tilgate Forest; and the lane leading to Darenth Wood, where it is sometimes abundant. Mr. C. G. Barrett writes, "It has been reared by Mr. Machin from larvæ feeding on *Rhamnus frangula*."

P. diminutana, Haw.—A local and uncommon species. The imago appears in June and July, and, Wilkinson says, among salallows; but I have on more than one occasion beaten a single specimen from wild cherry. It occurs at Croydon, Box Hill, and West Wickham; Darenth Wood, near Strood, and Folkestone; Haslemere, Tilgate Forest, and Hastings.

P. Mitterbacheriana, Schiff.—Common in all oak woods. The imago appears in May and June, and may be taken in abundance at dusk flying round the oaks. It is strong on the wing and flies high. The larva feeds on the oak.

P. upupana, Treit.—Rare, but widely distributed. The imago appears towards the end of May, and in June among oaks, and should be looked for at dusk flying around those trees. It has occurred at West Wickham several times; also at Darenth Wood, near Strood, Tunbridge Wells; and near Hastings. The larva feeds on the oak.

P. lactana, Fab. = *harpana*, Hub. = *ramella*, Linn.—An uncommon species, but distributed. The imago appears in May

and June among aspen (*Populus tremula*). Wilkinson gives as localities West Wickham Woods, Sydenham, and Dartford Heath fence; it also occurs at Wimbledon, Sidcup, Tilgate Forest, and Folkestone. The well-known locality for it in Darenth Wood is now closed to entomologists.

(To be continued.)

NOTES ON HYMENOPTERA.

By EDWARD CAPRON, M.D.

THE general scarcity of insect life was equally apparent last summer in the neighbourhood of Guildford as in other districts. The Aculeates and fossorial group of Hymenoptera were hardly to be seen; especially was it the case among the autumnal *Halicti*, which, usually abundant here on the heads of the various *Compositæ*, were last season entirely absent. In these families the only capture worth recording was another male of *Crabropteros*, taken almost exactly in the same place as the one I recorded in 1878. I bred thirteen specimens of *Spilomena troglodytes* from some dead bramble sticks, one male only among them; and caught on the wing one example of *Stigmus pendulus*. In the Tenthredinidæ two specimens of *Nematus lucidus* were my only additions. In the Ichneumonidæ I was more fortunate; and during the few really hot and fine days secured several fine species not hitherto recorded as occurring in Britain, and many of the less common ones already on the list.

Among the new species, *Eumesius egregius*, Holmg., of which a single female occurred, is one of the most beautiful and interesting; a good figure is given of it in Vollenhoven's 'Pinacographia' (pl. 33, fig. 8). With it I took also a female of another species of the same genus, which I am unable at present to identify: the abdomen is totally black, as also the posterior legs, the two anterior pairs being testaceous; the thorax, also, has no yellow markings.

Cataglyptus pulchricornis, Holmg.—Of this I took two females; it may be easily recognised by the tricoloured antennæ and peculiar aculeus turned up almost in a semicircle. Of the same genus both *C. fortipes* and *C. fuscicornis* occurred.

A *Mesoleius* I could not determine satisfactorily was returned

to me by Mr. Bridgman as *M. fallax*, Holmg., and I have little doubt is that species.

Lissonota caligata, Gr.—One specimen, a female; easily recognised by its very short aculeus.

L. lineata, Gr.—Gravenhorst never met with the female of this insect; and the Rev. T. A. Marshall has in his catalogue considered it only a variety of *L. bellator*. During the summer Mr. Buckler, of Emsworth, bred from some larvæ of *Crambus contaminellus*, both male and female, which he very kindly sent to me in a living condition: it is most undoubtedly a good species, and totally distinct from *L. bellator* not only in colour, but in the punctuation of the abdomen; it is more allied to *L. parallela*; the female has the same yellow markings on the thorax as the male.

Mesoleptus coxator, Gr.—Three specimens of this distinct species occurred.

Edemopsis scabriculus, Gr.—Like Mr. Bridgman I have taken examples both with and without the white ring to the antennæ; I can see no specific difference in them.

Cryptus bivinctus, Gr.—One example occurred of this fine species. I was surprised to find Mr. Marshall considers it to be the male of *Phygadeuon digitatus*. Not only does it appear to me to be a true *Cryptus*, and totally unlike any male *Phygadeuon*, but I have taken a male *Phygadeuon* which is without doubt the true male of *P. digitatus*; it is in every respect identical, except wanting the white ring to the antennæ. I believe Gravenhorst was right in the first instance; and it is now for someone to find the female of *C. bivinctus*.

The only *Pezomachi* were *Aptesis nigrocincta* and *A. microptera*, and *Hemimachus fasciatus* and *H. rufocinctus*.

Ichneumon albicinctus, *I. varipes* and *I. latrator* were abundant; the singular variety of the latter with undeveloped wings also occurred in moss; and Mr. Billups has also taken the same variety as well as the usual type.

I. terminatorius.—One example.

Amblyteles margineguttatus.—One example; a pretty species.

Phæogenes stimulator, *P. calopus* and *P. ischiomelinus*.—All more or less common.

Tryphon brachyacanthus.—One.

In the Ophionidæ, *Agrypon canaliculatum*, *Casinaria orbitalis*, *Sagaritis zonata*, and one specimen of *Banchus falcator*.

Singular to relate I have never taken any species of *Exetastes*, though apparently abundant elsewhere.

The genus *Limneria* abounded; many species I have not been able to determine with accuracy.

Mesochorus also gave me thirteen species, among them being *M. thoracicus*, *M. strenuus*, and *M. anomalus*.

In the genus *Megastylus* I have to add *M. borealis*, Holmg., taking at the same time *M. cruentator* and *M. mediator*.

In the Bracons I can also add several species new to Britain, the most interesting one being the fine *Homolobus discolor*. I took five females of this insect by beating some hazel. This appears to be the largest species of that tribe, and may easily be distinguished by the closed areolet of the inferior wings, as in *Zemiotes*, but having the sessile body of a *Macrocentrus*.

Rogas brevicornis, Wesm., and *R. tristis*, Wesm., also occurred, and appear to be previously unrecorded.

Among others I may also mention *Heterogamus dispar*, *Eubadizon pectoralis*, *Ichneutes reunitor*, *Macrocentrus marginator*, *M. thoracicus* and *M. linearis*, *Phænolexis petiolata*, *Symphyla hians*, *Cælinius niger*, *C. gracilis* and *C. elegans*; and many species of *Alysia*.

The *Oxyura* also yielded many species; the difficulty of their determination allows me to give two only as new, viz., *Spilomicrus major*, Voll., and *S. flavipes*, Thoms.

I added also the singular *Helorus anomalipes* and *Ismarus campanulatus* to my captures; and taking into consideration the extremely unfavourable season have no reason to be dissatisfied with my success in 1879.

I may also mention the occurrence in July of *Fænus minutus*, Tournier. This appears a very distinct species, and I therefore give a short description of it. I only obtained one female.

Fænus minutus, Tournier.—Length $4\frac{3}{4}$ lines; black; apex of first segment and apical half of second segment of abdomen red; tarsi and extreme base of tibiæ dark reddish; aculeus about as long as the first abdominal segment.

Shere, March 1, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LIFE-HISTORY OF AMPHYSA PRODRAMANA, *Hub.* = WALKERI, *Curtis*.—On April 24th, 1876, I received eggs of this species from Mr. White, of Droylsden, from which I bred a fine series of the perfect insect in March and April, 1877. I kept the brood up for several seasons, experimenting for the purpose at first of ascertaining their proper food, and afterwards to see what they would or would not eat. At last I gave them up, for I found they would eat—I may say—anything, except the leaves of trees; but there is no doubt that they prefer *Potentilla tormentilla*, and live upon it in a state of nature. Some of the larvæ were fed in a flower-pot, in which that plant, *Rumex acetosa*, and narrow-leaved plantain were grown together, with knotgrass, *Silene*, &c. They ate all these plants, but preferred the *Potentilla*; next to that the largest number preferred the plantain, turning the edge of the leaf over to form a comfortable home. Having taken to a plant they do best if supplied with that food for the remainder of the larval state, and do not readily leave it to go to other food, nor do they do well if the food is changed. The eggs are laid in patches upon *Vaccinium* leaves, and upon those of other plants, where I have since taken them; they are embedded in a glutinous substance; when dry this gives the leaf a yellowish blotched appearance, which on close examination shows the eggs laying in the blotch. The eggs are laid at the end of March and during April, hatching in May; the larvæ make up in June; the perfect insects appear in the following March and April. The larvæ are rather slender; colour dull pea-green, inclined to olive; size over three-eighths of an inch; head light ochreous, with two distinct black spots on the sides below; corselet broad, with suture indicated, and covering the whole of the upper part of the second segment; dorsal region dark, and the papillæ light, but not well pronounced; spiracular region light; anal region light, with large light claspers. Pupæ formed during June, amongst the dead leaves laying at the bottom of the breeding-boxes. Mr. White first discovered this larva, and kindly sent eggs to me, as before observed. — C. S. GREGSON; Rose Bank, Fletcher Grove, Liverpool, February 22, 1880.

LEPIDOPTERA IN 1879.—My entomological experience in 1879 was but little, but some notes, made from time to time, may prove interesting for comparison, and will show how exceptional was the season.

Lycana Adonis.—This butterfly, from some cause, is evidently becoming much less common. Before leaving Folkestone, on September 22nd, I only took six, though I was several times on the downs. On October 6th, during a brief visit, I captured about twenty specimens; some of the females had the blue tint of the summer brood.

Nola albulalis.—My first specimen was captured on July 29th; but it was the first week in August before any numbers were to be found.

Calligenia miniata and *Acidalia rusticata*.—A few of each, apparently just emerged, taken in August.

Eurymene dolabraria.—One specimen bred from galls.

Aspilates gilvaria.—Out plentifully in good condition, at Dover, in September.

Cidaria sagittata.—About thirty specimens, bred from larvæ taken in 1877; emerged between June 18th and July 20th.

Botrys pandalis.—Not out till the middle of June.

Spilodes palealis.—Taken at Folkestone the third week in August.

Cryptoblabes bistrigella.—Two bred from galls, June 9th and 12th.

Tortrix Branderiana.—A female taken at Folkestone, September 12th.

Peronea Schalleriana.—The ordinary form, and the variety *Latifasciana*.

Sciaphila perterana.—A fine and very variable series.

Grapholita nigromaculana, *Pedisea ophthalmicana*, and *P. solandriana*.—All taken at Folkestone in September.

Ephippiphora nigricostana.—Several bred between June 8th and 22nd.

E. signatana.—Taken at the end of July near Strood.

E. gallicolana.—Bred from galls between May 12th and June 23rd; very few, but large in size.

Coccyx splendidulana.—Bred from galls, coming out at intervals between March 30th and June 13th.

Heusimene jimbriana.—A fine series; emerged from galls between March 19th and April 29th.

Retinia turionana.—Scoured the country far and wide, and only bred four specimens from pine shoots. This insect seems to have disappeared in many localities where it used to occur.

Stigmonota puncticostana.—Taken near Strood at the end of June.

Argyrolepis Dubrisana.—Several large and finely-coloured specimens, taken at Folkestone in September.

Cochylis gigantana.—A long series, taken at Dover and Folkestone between September 4th and 20th. Those taken on the last-mentioned day had only just emerged.

C. inopiana.—A few captured, near Strood, in August.

Lemnatothrips salicella.—One bred from galls, March 19th.

Depressaria pallorella.—Several specimens, taken at Dover in September.

This species must be looked for at the bottom of tufts of grass.

Pterophorus acanthodactylus.—A rather long series, taken at Croydon in August.

—BATERSHELL GILL; 9, Cambridge Terrace, Regent's Park, N.W.

NOTES FROM HARWICH FOR 1879.—During the past season I captured seventy-one species of Noctuæ at sugar. *Thyatira derasa* was plentiful, and not at all shy, as mentioned by the Rev. J. Greene in his 'Insect Hunter's Companion'; they did not attempt to move whilst being boxed. Of *T. batis* I took two; *Leucania littoralis*, three; *Senta ulvæ*, one; *Dipterygia pinastri*, plentifully; *Mamestra abjecta*, five; *Apamea gemina*, plentifully; *Agrotis suffusa*, three (this species was very plentiful in 1878); *A. saucia*, plentifully; *A. ripæ*, plentifully; *Aplecta advena*, two; *Hadena adusta*, one; *H. suasa*, seven; and of *H. genistæ*, eight. At light I captured two specimens of *Leucania phragmitidis*, one *Plusia iota*, and two *Coremia quadrfasciaria*; and I bred one *Luperina cespitis* from a pupa I took at the roots of a poplar tree.—F. KERRY; Harwich.

A MONTH IN THE NEW FOREST.—I spent the month of September, 1879, at Brockenhurst, in the New Forest, with the primary object of taking a good long series of *Peronea cristana*; but although I had the best localities pointed out, and the most systematic method of working kindly shown me by Mr. E. G. Meek, I failed to obtain more than a dozen specimens. Yet I was assured by George Gulliver of that place—who also showed me where to get "t' buttons"—that in 1878 they were not uncommon, and in 1877 plentiful. *Leptogramma literana* were to be had freely, and I met with two or three striking varieties. *Peronea sponsana* were not scarce, neither were *P. schalleriana* and *P. comparana*. *Teras caudana* also was frequent, and a few varieties of that species. At larvæ beating I was more successful. Of *Stauropus fagi* I got four, but only one reached the pupal stage. Also a few each of *Dicranura furcula*, *Notodonta tictæoides*, *N. dromedarius*, *N. ziczac*, *N. dodonea*, and *Thyatira batis*; several of *Platypteryx falcata* and *Tephrosia consonaria*, and of *Diphthera orion*. *Acronycta leporina*, *Eurymene dola-braria*, *Amphydasis betularia*, *Ephrya trilinearia*, *Tephrosia*

crepuscularia, *Halias prasinana*, and *Lithosia rubricollis*, a good number; also a few unrecognised species of larvæ. On one small willow bush in a hedge I found thirty-two larvæ of *Smerinthus ocellatus*, some nearly full fed, others quite small; six were striking out from one twig. I thought at first sight they were merely curled leaves; I have often found the larvæ before, but never saw more than two or three near each other. Ragwort yielded two or three species of *Eupithecia* larvæ and *Euchelia jacobææ*. I sugared one or two nights, but as I only saw one *Catocala promissa* and a few *Amphipyra pyramidea* I turned my attention to the heath blossom, though without any better success, for, with the exception of *Cidaria testata*, which was abundant, I only got one *Platypteryx hamula*, one *Agrotis agathina*, one *Noctua neglecta*, and three *N. C-nigrum*.—RICHARD SOUTH; 13, Bonchurch Villas, Ealing, January 8, 1880.

CARADRINA MORPHEUS.—I bred about two dozen specimens from larvæ found in October, 1878, on various low plants in Hackney marshes, but principally on wild hop (*Humulus lupulus*) and *Chenopodium*.—W. MACHIN; 22, Argyle Road, Carlton Square, E., Dec. 11, 1879.

COLEOPHORA WILKINSONELLA, &c.—I have pleasure in recording the occurrence of this scarce northern species in the South of England. While searching the birches for Micro-lepidoptera in the forest at Snaresbrook, in October last, I found three cases containing larvæ of the above species, and a friend also took two. *Ornix betulævorella* was commoner than usual; and *Lithocolletis ulmifoliella* plentiful on the same trees; and on hornbeam were *L. carpinicolella* and *L. tenella*.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, London, E., March 9, 1880.

NOTES ON BREEDING ACRONYCTA LEPORINA.—The abnormal summer of 1879 did not prove with me an unprofitable one, so far as collecting Noctuæ is concerned; in fact it was better than the two previous seasons, and about equal to 1876, in which year, on July 17th, I took a female *Acronycta leporina*, from which I have bred a nice series. The life-history of this brood having extended over three years, I now venture to offer my notes, thinking that they might be of interest to some of your readers. Upon taking the moth (a female) I placed it in a box with some

sugar mixture, of which it freely partook. On the following day (the 18th) it deposited four eggs, and added twenty-four on the 19th, twenty-three on the next day, thirty-one on the next, and four on the 22nd. The fertile eggs in twenty-four hours changed to a chocolate colour; but about half of the whole proved to be barren. The first larva emerged on July 27th. Unfortunately at the end of that month I had to leave home for four days, so the young brood had to take their chance upon a small branch of birch placed in water and covered with a glass. Upon my return only nineteen were alive; two of these were of the dark variety. By September 2nd they were full fed: I then tendered them some pieces of cork and blocks of half-decayed wood; seventeen preferred the latter, while two took the former. In examining their holes I thought it worthy of remark, that after the larva has entered a little way it turns off at an angle, the pupa remaining at the extreme end, so that it is well provided for against the intrusion of birds or other enemies. Three imagines appeared the next year; the first on June 17th, and the last on July 5th. I then tried to force the remainder; but although they were kept for three weeks in a very warm temperature they would not yield to the treatment, and were ultimately removed to a cooler place to see what 1878 would produce. The first half of June in that year was unusually cold and damp, but in the latter part of the month the weather became excessively hot: the result was that nine moths came out between the 12th and 28th. The next did not appear till July 6th, 1879, another on the 9th, and one more on the 12th, which completed a total of fifteen. Upon opening one of the blocks last November I discovered that a pupa was still alive; however it has since died. In another instance I found a dead moth partly out; but owing to another larva having pupated in front of the same it could not escape. Should it be thought that in a natural state this species only requires heat and moisture to annually produce a full brood, I would point to the fact that they were placed under these circumstances in 1878; but between the 21st and 30th of June only five came out, while the dreadful cold and wet days from the 6th to the 12th of last July also yielded three specimens. It also happened to be the exact number which attained their perfect condition during the first year of their existence.—H. T. DOBSON, jun.; New Malden, Surrey, February 23, 1880.

LATHETICUS ORYZÆ: A NEW BRITISH COLEOPTERON.—Through the industry and perseverance of Mr. T. R. Billups this insect has been added to the list of British Coleoptera. Although specimens have been in the British Museum, and other collections, for some time, it has remained to this present time a nondescript. As it turned up conspicuously among those other grain insects, about which Mr. Billups wrote an article in the November 'Entomologist' (Entom. xii. 267), attention was called to it; and the result has been that it has been described by Mr. C. O. Waterhouse, under the above name, in the 'Annals and Magazine of Natural History' for February, 1880, pp. 147, 148. Its place in our cabinets will be between the genera *Tribolium* and *Gnathocerus*. It is a widely-distributed insect, but its claim to be inserted as a British beetle is this. It occurred to Mr. Billups in wheat sent him from Mr. Fitch's granaries, and since then I have it in a sample of English weevilled wheat from Addiscombe; but the strongest proof that it is entitled to a place is that it was obtained by Mr. Marsh, about five or six years ago, in Burnt Ash Lane, by sweeping. Now that attention is drawn to it we shall probably hear of it from other parts. Another insect obtained from the same wheat at the same time was a very small *Læmophlæus*, distinct from *L. ferrugineus*, and which answers to the *L. minimus* of Stephens's 'Manual.' This is *Læmophlæus pusillus*, Schön., of Waterhouse's Catalogue, and of Rye's also; but it is omitted by Sharp. This insect has also been under careful inspection, and will be mentioned by Mr. Billups in his next article on the corn weevils and their associates.—VINCENT R. PERKINS; 54, Gloucester Street, S.W.

[All of these are undoubtedly imported insects. They have certainly bred in England in limited localities, but can scarcely be said even to be naturalised; the same may be asserted of many other so-called British insects, of which, however numerous they may be in granaries, &c., single specimens only have been found really at large, and that but seldom,—escapes, as it were, from the main body. They may perhaps be said to belong to our British fauna; but I think that these, and many others which we are sure are not indigenous, ought to be carefully distinguished from truly British insects.—J. A. P.]

FORCING LEPIDOPTERA.—On February 14th, by way of experiment, I placed six cocoons of *Saturnia carpinii*, six *Bombyx*

quercus, three *Orgyia pudibunda*, and two pupæ of *Pieris rapæ*, in one of my breeding cages, upon the mantelshelf of my sitting room, with a view of forcing them. The following was the very gratifying result:—On the 18th a fine male *O. pudibunda* made its appearance, followed on the 20th by another, the remaining one (also a male) not coming out until this morning; one of the *P. rapæ* hatched on the 22nd, the other I find is dead; on the 23rd the first of the *S. carpini* (a male) appeared, and on the following day a female, who has laid about sixty eggs; no more appeared until the 27th, when I discovered another male, followed on the 28th and 29th by a female and two more males; the *B. quercus* have not yet shown themselves. I may as well mention that the *S. carpini* and *P. rapæ* emerged between five and six p.m.; the *O. pudibunda* in the morning.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., February 29, 1880.

THE ERADICATION OF MITES.—Some time since, on my return home after a few weeks' absence, I found these dreadful pests causing much havoc in my boxes. After removing the specimens most affected I treated the rest with a solution of carbolic acid, washing over part of the inside of the boxes with the same solution. After this treatment for some days I placed some of the dust, which collected at the bottom of the boxes, under the microscope, and to my surprise found that the mites were not dead. I then tried bichloride of mercury (common sublimate) and cyanide of potassium successively, but with no better result. I then determined to try carbon bisulphide (the vapour of which has been used with tolerable success for the extermination of *Phylloxera*, by the gradual decomposition of sulpho-carbolate of lime), and poured a few drops of the pure liquid into each of my boxes, closing them at once, and renewing the dose after a few days. On examination of the dust I then found them all killed. It is essential for their destruction that the boxes be charged with the vapour for some days, otherwise only the perfect insects will be destroyed. The chief objection to the use of this chemical is its bad smell, but it has the advantage of entirely evaporating on leaving the boxes exposed for an hour or so.—N. C. GRAHAM; Silwood, Tulse Hill, March 7, 1880.

ERRATA.—Page 62, line 9 from foot, for "*silene*" read "*Selene*"; and line 4 from foot, for "*Iriglaus*" read "*Juglans*."

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INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By J. B. BRIDGMAN AND E. A. FITCH.

No. II.—ICHNEUMONIDÆ.

GRAVENHORST'S 'Ichneumonologia Europæa' (1829) is the text-book of Ichneumons generally, but of the first family, Ichneumonidæ, Wesmael has made himself the authority, *par excellence*. His eight remarkably lucid memoirs,* published by the Brussels 'Académie Royale,' were, however, never completed and collated by himself; which is to be regretted. Wesmael primarily divided the Ichneumonidæ into five subfamilies, as follows:—

- A. Spiracles placed between the middle and apex of 1st segment.
- a. Metathoracic spiracles linear, or linear-elliptic; rarely oval.

* Petiole of abdomen not depressed.

- † Abdomen of female with an acute apex; the last ventral segment more or less remote from the base of the aculeus. - - - - 1. *Ichneumones oxygygi*.

* "Tentamen dispositionis methodicæ Ichneumonum Belgii" (1844, 'Nouv. Mém. Ac. Brux.,' xviii., 238 pp., 1 pl.); "Mantissa Ichneumonum Belgii" (1848, 'Bull. Ac. Brux.,' xv., pt. 1, pp. 138—187, 292—341); "Adnotationes ad descriptiones Ichneumonum Belgii" (1849, 'Bull. Ac. Brux.,' xvi., pt. 1, pp. 35—44); "Ichneumones platyuri Europæi" (1853, 'Bull. Ac. Brux.,' xx., pt. 3, pp. 297—328); "Ichneumones amblypygi Europæi" (1854, 'Bull. Ac. Brux.,' Annexe, pp. 77—142, 1 pl. with 17 figs.); "Ichneumonologia miscellanea" (1855, 'Bull. Ac. Brux.,' xxii., pt. 2, pp. 362—435); "Ichneumonologia otia" (1857, 'Bull. Ac. Brux.,' 2nd ser., ii., pp. 355—426); "Remarques critiques," &c. (1859, 'Mem. couron. Ac. Belg.,' 8vo, vol. viii., pp. 1—99).

†† Abdomen of the female obtuse at the apex; the last ventral segment reaching, or almost reaching, the base of the aculeus. - - - - 2. *Ichneumonones amblypygi*.

** Petiole slightly depressed (that is the transverse diameter is a little larger than its vertical diameter).

3. *Ichneumonones platyuri*.

b. Metathoracic spiracles circular. 4. *Ichneumonones pneustici*.

B. Spiracles placed in the middle of the 1st segment of the abdomen. - - - - 5. *Ichneumonones heterogastrici*.

To the above Holmgren has added, in his valuable but unfinished 'Ichneumonologia Suecica' (1864—71):—

1. *Ichneumonones oxygygi*: 2nd to 4th ventral segments of the male furnished with an elevated fold after death.

2. *Ichneumonones amblypygi*: 3rd to 8th or 4th to 8th ventral segments smooth; 2nd and 3rd segments sometimes have a short elevated fold.

The first division is easily recognised, as far as regards the female, by the last ventral segments having a longitudinal slit, which is wanting in the other divisions. The males are not so easily distinguished, but the presence of the ventral fold is the best mark; still this is sometimes present in the *I. amblypygi*. Further notes to the 'Ichneumonologia Suecica,' by Holmgren, are now in course of publication in the 'Entomologisk Tidskrift;' and Tischbein's recent tables, in the Stettin 'Entomologische Zeitung,' should specially be referred to.

We shall not waste space by describing the general appearance of the family of Ichneumonidæ, because there are now so many good figures in various works which give a much better idea of the insects than we could do by description. The number of species is large. Kirchner makes 556 in his 'Catalogus Hymenopterum Europæ' (1867), but of these it must be said that their synonymy has received but little attention. A few small genera belonging to the Cryptidæ and Pimplidæ are also here included amongst the Ichneumonidæ. Dours, in his 'Catalogue synonymique des Hyménoptères de France' (1874), gives but 135 species; and here also *Stilpnus* and one or two other small Cryptid genera are included. Marshall's first 'Catalogus' (1870) included 262 British species; his Entomological Society's Cata-

logue, which is strictly synonymic, contains 258 species, and to these there are a few additions to be made, which will be mentioned amongst their respective genera.

The *Ichneumones oxygygi* have been tabulated by Holmgren, as follows:—

A. Scutellum generally slightly convex, slightly sloping at the tip.

a. Apex of clypeus emarginate: head of female buccated or swollen; abdomen narrow and pointed.

Gen. 1. *Chasmodes*, Wesm.

b. Apical margin of clypeus entire, or sometimes somewhat sinuous.

* Abdomen of the female with 8th dorsal segment exerted.

Gen. 4. *Exophanes*, Wesm.

** The 8th dorsal segment not exerted.

Gen. 2. *Ichneumon*, Lin.

B. Scutellum somewhat gibbous, abruptly sloping behind; sides of the metathorax with spines.

Gen. 3. *Hoplismenus*, Grav.

Before commencing the tables of species it must be observed that many, or perhaps we might say most, of these insects vary greatly in coloration; for instance, the face of the male is generally marked with white or yellow; sometimes the face is completely pale, sometimes only a thin streak by the sides of the eyes, and sometimes the face is quite black; these differences will occur as varieties of the same species. The legs also in one variety will be quite black, except that the front pair are slightly pale, whilst an extreme variety will have all the legs red. The same with the marks on the thorax, which are generally confined to the collar, lines or spots before and below the wings, the scutellum and post-scutellum; these sometimes are present, sometimes entirely wanting. So also with the abdomen; some of the black species will have the margins obscure red, some of the segments more or less red, and in some instances the entire abdomen sordid red; for example, see the varieties of *Ichneumon lineatus*. Great variation also is found in those *Ichneumons* which have the abdomen yellow and black, the yellow being sometimes more or less marked with black; the same may be said of those we shall allude to as having the abdomen tricoloured

- ** Front coxæ black; tarsi white; hinder apex obscure.
 17. *comitator*, 6—8½ lines (s)
- b. Hind tibiæ white outside.
 * Face without pale marks. - - 144. *tibiator*, about 2 lines.
 ** Face with pale marks. - - 73. *pallifrons*, 4—7 lines (s).
- c. Hind tibiæ not marked with white.
 * Thorax not marked with white.
 † Hind femur red; extreme apex black. 135. *obator*, 4—4½ lines.
 †† Hind femur entirely red. - - 63. *cessator*, 6—7½ lines.
 ††† Hind legs black.
 † Front femur and tibiæ red. - 74. *maculifrons*, 5—5½ lines (h).
 †† Front tibiæ yellow. - 75. *coruscator*, 5—5½ lines (h, t, s, l, a).
 ††† Front tibiæ white within, remainder black.
 133. *nigerrimus*, 6 lines.
- ** Thorax with pale marks.
 + Basal keels of scutellum black.
 § Face entirely yellowish white. - - 79. *clericus*, 5 lines.
 §§ Orbits internally and externally more or less yellow.
 o Areolet towards the costa narrow. 2. *bilineatus*, 6—8½ lines (s, l).
 oo Areolet towards the costa wide. - - 18. *derasus*, 6 lines.
 + + Basal keels of scutellum white.
 + + 2nd segment somewhat longer than wide.
 10. *lineator*, 6—9 lines (t, s, l, a).
 + + + 2nd segment not longer than wide. - 15. *impressor*, 6 lines.

SECTION 2.—Scutellum black; abdomen black, with white marks.

- A. Intermediate segments only marked with white (females).
 24. *multicinctus*, 5½ lines.
- B. Apical segments only marked with white (females).
 a. Antennæ with a white ring.
 * Hind femur red. - - 79. *clericus*, 5 lines.
 ** Hind femur greater part black.
 † Front tibiæ red.
 † Middle area of post-petiole aciculate. 68. *Faunus*, 4—5 lines (l, s).
 †† Middle area of post-petiole scabriculous. 65. *gemellus*, 5½—7 lines.
 †† Front tibiæ partly whitish or pale straw outside.
 § Middle area of post-petiole aciculate. 73. *pallifrons*, 4—7 lines.
 §§ Middle area of post-petiole rather smooth and shining.
 76. *varipes*, 2—3½ lines (male differs in having no ring on antennæ).
 b. Antennæ not white-ringed. - - 63. *cessator*, 6—7½ lines.

SECTION 3.—Scutellum white or red; abdomen black, or the edges pale.

- A. Antennæ with a white ring (females).
 a. Tibiæ without white.
 * Thorax with no white line before the wings.
 8. *sinister*, 7½—9 lines (a).
 ** Thorax generally with a white line before the wings.
 † Gastrocæli of 2nd segment of abdomen distinct.
 † Vertical orbits of eyes spotted with white.

- § Antennæ very slightly compresso-dilated before the apex.
9. *leucocerus*, 7½—9 lines.
- §§ Antennæ distinctly compresso-dilated before the apex.
- × Areolet of wing pentagonal. 10. *linearis*, 6—9 lines (*t, s, l, a*).
- × Areolet of wing triangular. - - - 12. *mæstus*, 3—4½ lines.
- †† Vertical orbits of eyes not spotted with white; lateral margins of scutellum white.
- o Stigma nigro-fuscous. - - - 25. *trilineatus*, 6—8 lines (*l, a*).
- oo Stigma red. - - - 26. *scutellator*, 5—6 lines (*a*).
- †† Gastrocæli of 2nd segment almost entirely absent.
- + Areæ of metathorax, five complete. - 78. *jugatus*, 5—6 lines.
- + + Areæ of metathorax, three complete. 80. *rufifrons*, 2½—6 lines (*a*).
- b. Tibiæ (especially the hind one) with white ring.
- * Femora and part of tibiæ red. 71. *fabricator*, 5—7 lines (*s, a*).
- Smaller and external radial nervure incurved.
72. *curvinervis*, 2½—4 lines (*s*).
- ** Hind femur and part of tibia black.
- † Face black. - - - 22. *pistorius*, 7½—8 lines (*t, a*).
- †† Face with the orbits white.
- † Middle area of post-petiole aciculate-punctated.
20. *fuscipes*, 6—9 lines (*a*).
- †† Middle area smooth, or with a few punctures.
87. *oscillator*, 7½—9 lines (*h, t, s*).
- A. Antennæ white-ringed (males).
- * Post-petiole aciculate(†) or punctate-aciculate(††).
- † Inner orbits and marks in front of wings white.
- † Scutellum white and legs black.
- ‡ Tibiæ without white marks. - - - 8. *sinister*, 7½—8 lines.
- §§ Tibiæ with white marks. - 22. *pistorius*, 7½—10½ lines (*h, a*).
- †† Scutellum, lateral margins white; legs vary from greater part red to quite black (antennæ generally without ring).
25. *trilineatus*, 6—8 lines (*l, a*).
- †† Face and marks before wings white.
- ** Post-petiole alutaceous (×) or scabriculous (××).
- × Supero-medial area of metathorax semicircular.
70. *punctifrons*, 4—5 lines (*s*).
- × × Supero-medial area of metathorax quadrate.
99. *ochropus*, 4—5½ lines.
- B. Antennæ not white-ringed (males).
- a. Tibiæ (especially the hinder one) ringed with white; legs the greater part black.
- * Middle area of metathorax striated (aciculate).
- † Hind tarsi not marked with white. 20. *fuscipes*, 6—9 lines (*a*).
- †† Hind tarsi marked with white. 27. *multiannulatus*, 6—8 lines.
- ** Middle area of metathorax smooth, or with a few punctures.
- † Gastrocæli of 2nd segment of abdomen obsolete.
80. *pallidatorius*, 2½—6 lines.
- †† Gastrocæli of 2nd segment distinct. 87. *oscillator*, 7½—9 lines.
- b. Hind tibiæ not marked with white.
- * Front coxæ white, or marked with white.
- † White marks on the angles before the scutellum.
11. *albicillus*, 5½ lines.

- †† No white marks before the scutellum.
 †† Lateral margins of scutellum white. - 26. *scutellator*, 6 lines.
 ††† Scutellum and post-scutellum marked with sulphur-colour. 102. *exornatus*, 4—6 lines.
 ** Front coxæ not white.
 § Middle area of post-petiole aciculate.
 × Vertical orbits of eyes marked with white.
 † No white marks at the base before the scutellum.
 o Scutellum white. - - - - 9. *leucocerus*, 7½—9 lines.
 oo Two white marks at the apex of the scutellum. 65. *gemellus*, 5½—7 lines (*s*, *l*, *a*).
 ooo Lateral margins of scutellum white. 25. *trilineatus*, 6—8 lines (*l*).
 §§ Middle area of post-petiole rugose; supero-medial area of metathorax quadrate; areolet of wing wide above; four front femora and tibiæ pale red; apex of scutellum only, white. 110. *albifrons*, 5½—6½ lines.
 †† Basal keels before the scutellum generally white.
 + 2nd segment of abdomen somewhat longer than wide. 10. *lineator*, 6—9 lines (*t*, *s*, *l*, *a*).
 × × Vertical orbits of eyes not marked with white.
 ++ Femora black.
 ∞ Hind tibiæ marked with faded straw-colour, or quite black. 31. *languidus*, 7—7½ lines (*t*).
 ∞∞ Hind tibiæ red, apical half black. 64. *submarginatus*, 5—7 lines.
 +++ Femora and tibiæ red, apex of hinder one black. 52. *quadrialbatus*, 4—5 lines.
 §§§ Middle area of post-petiole alutaceous(*), or rather smooth(**). *71. *fabricator*, 5—7 lines (*h*, *s*, *l*, *a*).
 External radial nervure much incurved at the apex. **72. *curvinnervis*, 2½—4 lines (*s*).
 §§§§ Middle area of post-petiole aciculate-punctated.
 No white marks before the wings; femora and tibiæ red, sometimes greater part black. 84. *monostagon*, 5—6½ lines (*s*, *l*).

SECTION 4.—Scutellum more or less pale; abdomen black; apical segments generally pale.

- A. Scutellum and marks in front of wings reddish (females). 99. *ochropus*, 4—5½ lines.
 B. Scutellum yellowish white, or white (females).
 a. Tibiæ (especially the hind one) marked with white; legs the greater part dark.
 * Vertical orbits broadly white. - 116. *cingulipes*, 6½ lines.
 ** Frontal orbits red, if not black.
 † Area of metathorax, five complete. 27. *multimaculatus*, 6—8 lines.
 †† Area of metathorax, three complete.
 † Hinder coxæ without pubescence beneath. 39. *melanotis*, 7—8 lines (*a*).
 †† Hinder coxæ with pubescence beneath. 28. *molitorius*, 6—9 lines.
 b. Tibiæ not marked with white.
 * Gastrocæli of 2nd segment of abdomen moderate.
 † Middle area of post-petiole aciculate; vertical orbits not marked with white.

- † Hind femora red.
 § Supero-medial area of metathorax subquadrate.
 52. *quadrialbatus*, $4\frac{1}{2}$ —5 lines.
 §§ Supero-medial area of metathorax transverse.
 62. *quæditorius*, $6-7\frac{1}{2}$ lines.
 §§§ Supero-medial area of metathorax subhexagonal, or semioval.
 67. *saturatorius*, 5—6 lines (*l*).
 †† Hind femora dark.
 × Hind tibiæ partly red.
 o Scutellum closely punctured. - 40. *inquinatus*, $5\frac{1}{2}$ —6 lines (*a*).
 oo Scutellum sparingly punctured.
 + Mesothorax and scutellum much higher than the metathorax.
 64. *submarginatus*, 5—7 lines.
 + + Mesothorax and scutellum scarcely higher than the metathorax.
 30. *computatorius*, 6—9 lines (*t, a*).
 × × Hind tibiæ black. - - - 132. *microcephalus*, 6—7 lines.
 × × × The pale part of tibiæ sordid straw-colour. 31. *languidus*, $6\frac{1}{2}$ lines.
 †† Middle area of post-petiole smooth. - 140. *relucens*, $6\frac{1}{2}$ lines.
 ** Gasterocæli of 2nd segment of abdomen small.
 † Middle area of post-petiole rugosely aciculate, or aciculate-punctated.
 † Femora black. - - - 84. *monostagon*, $5-6\frac{1}{2}$ lines (*h, l*).
 †† Middle area of post petiole more or less punctated.
 § Back of the 7th segment white. - 85. *dumeticola*, 5—6 lines.
 §§ Back of the 7th segment with a white spot.
 86. *leucomelas*, $6-7\frac{1}{2}$ lines.
 †† Femora red. - - - - 93. *anator*, 4—5 lines.
 A. Antennæ without a white ring (males).
 a. Middle area of post-petiole aciculate. - 68. *Favrus*, 4—5 lines.
 b. Middle area of post-petiole punctated. 93. *anator*, 4—5 lines.
 B. Antennæ with a white ring (males).
 * Four front femora and tibiæ greater part white.
 116. *cingulipes*, $6\frac{1}{2}$ lines.
 ** Femora and tibiæ not marked with white.
 † Inner orbits faintly marked with white.
 132. *microcephalus*, 6—7 lines.
 †† Inner orbits not marked with white.
 67. *saturatorius*, 5—6 lines (*l*).

(To be continued.)

CAPTURES IN NORTH LANCASHIRE IN 1879.

By J. B. HODGKINSON.

It may interest some of your readers to know how insect life appeared in the district through such a sunless summer as the last. I may say, with the exception of September, an almost constant daily downpour of rain fell in the district where I spent some six months of last season. This was at Dutton, about eleven miles from here, amongst the hills. No doubt Pendle

Hill, the highest hill in Lancashire being close to, had something to do with the rainfall. It was never safe for many hours to be far away from some sort of shelter, for, although it was cold and sunless, heaven's artillery opened fire both by night and day; during a great part of the season it seemed out of place not to be saluted by sudden heavy peals of thunder. One day, too near to be pleasant,—a sudden flash, a heavy crash, and the electric fluid,—a veritable thunderbolt fell a few yards from me.

Moths of all sorts were very late: March species out in June, such as *Teniocampa rubricosa*, *Cidaria suffumata*, &c.; while July species, such as *Carsia imbutata*, I took at the end of September. Great numbers of specimens I should say never emerged at all; I should think especially such species as *Dicranura bicuspis*; I only saw one new empty case where the moth had gone, after looking over thousands of alder tree trunks. I did a little sugaring, but owing to the continuous rains I could not go into the woods which were most likely. Some of the woodland species seemed to be in countless numbers among the *Vaccinium* (bilberry); *Grapholita geminana*, *Peronea Caledoniana* and *Penthina sauciana* larvæ seemed to have literally blighted the plants; all the tops looked yellow, acre after acre; few of the berries were to be found. The old gamekeeper would not believe it was the work of caterpillars. For some time when the moths appeared it was simply a useless task to try to catch anything else but *Grapholita geminana* and *P. Caledoniana*; only hit a tree and they came out in swarms.

The country being comparatively new to me I had many a journey to no purpose on exploring expeditions. I did expect the honeysuckles to repay me with some *Plusia bractea*; but nothing better than *P. v-aureum* and *P. iota*; *G. geminana* became a pest and a plague, completely driving me from the lower grounds. I took a man with me to the *P. bractea* locality, where I used to take nothing else some thirty years ago. Well, moths came thick and fast; I struck twelve moths in succession. I came home in great glee, and, anxious enough to pin all my *P. bractea*, chloroformed them at once,—pins, poison, and all ready. I invited my wife to come and see the great catch: opening a box out tumbles *P. gamma*; twelve *P. gamma* instead of twelve *P. bractea* being the result. But off I go again and again, with the same luck; so at last I left utterly disgusted, not having got a specimen.

I hope this season to reverse the catch, for it is not often that two seasons together the same pests appear.

I next tried light: I used two rooms, with great flaming lights in each, with a looking-glass behind the lights. This was by far the most successful and easy way of catching moths I experienced. I left the lights all night, with a pane of glass broken in each room. I generally got up about two in the morning to put the lights out, and the moths were sticking all about next day. A crumpled-up newspaper was a favourite hiding-place for them. When I first began operations, with five lamps in one room, the policeman came hurrying up a couple of miles thinking the house was on fire. One night I took over forty species: it was rather curious to see what persistent comers were *Noctua brunnea*, *Miana arcuosa*, and *Nonagria fulva*; the former lasted over two months. Besides using the other rooms I opened my bed-room window, and left the lamp burning, turning the looking-glass to the window: in came *Arctia menthastri* and *A. lubricipeda* by scores. Next day, when the room was looked round, "ermine" were sticking about like snow-flakes, but no varieties worth note.

The best species, out of large numbers of moths that came to light, were *Caradrina alsines*, several; *Selenia lunaria*, *Pericallia syringaria*, *Stilbia anomala*, *Hydræcia nictitans*, *Luperina testacea*, *Heliothrips popularis*, *Crocallis elinguaris*, *Plusia pulchra*, *P. iota*, *Notodonta camelina*, *Epione apiciaria*, and *Scoparia muralis*, by the score. The only Plumes that came were *Pterophorus acanthodactylus*, and *P. Bertrami*. *Eupithecia pulchellata*, *E. subfulvata*, *E. assimidata*, &c., turned up. I hope *Dicranura bicuspis* will pay me a visit this season. My apparatus was rather too late in being applied last year.

The grandest little patch of collecting ground in the neighbourhood was about fifty yards of rough open ground in a young plantation. This place literally swarmed with Micros. In the space of ten yards I took over a hundred *Phygadeuon*; I fancy the larva feeds in the stem of the knapweed; I could not sweep any off plants in flower. I swept the new *Trifurcula pallidella* and *Nemotois minimella*, *Cemastoma Wailesella*, *Depressaria atomella* (the true species), and many other good species. One little wet sheltered corner on the moors yielded me a couple of hundred of the hitherto rare *Elachista alpinella* of Edleston. The female of this species is rather the handsomer.

Of larvæ, those of the larger species I may say were scarce. Two small aspens close to my door seemed to yield most. The first on the roll were *Tethea subtusa* in plenty, but difficult to breed. At the same time were *Pædisca ophthalmicana*; I got tired of setting this species; I must have set a hundred and fifty or more, and I had not a decent specimen before. Under the same trees, in August, I put a sheet, and down came *Smerinthus ocellatus*, *S. populi*, *Notodonta dictæa*, and a cloud of *Cymatophora* or larvæ. I first thought the sheet was covered with sawfly larvæ. By beating the alders I got lots of larvæ of the *Notodontæ*; but it is hard work striking overhead with a twelve-foot pole; only one larva of *Dicranura bicuspidis* came, and that fell on to a lad's jacket. It is a lovely larva, and for colour puts all the others of the genus into the shade. There is a little history about this larva: I nursed it carefully, kept it by itself well fed, with two or three bits of bark in the flower-pot; one day I had lost it, and could neither find pupa nor larva living or dead; I placed the chips of bark on the table, taking my magnifying-glass to look for the pupa; nothing could I see; when picking up the little bit of bark to put back in the pot it felt heavy; when I turned it up to see how it was, there was the pupa, snugly made up between a loose bit of chip and the inner side of the bark. The larva came off the same tree from which I got a male moth. I got hundreds of larvæ off the stitchwort, &c., by sweeping at night; nothing of note turned up, the best being *Plusia pulchrina*. Smoking with touch-paper was a good help, moths being driven down amongst the herbage by the rains. I saw many larvæ of *Eidophasia messingiella*; *Plusia interrogationis* was scarce.

One fine evening *Noctua neglecta* and *Cloantha solidaginis* were very busy on the flowers of the heather. *Nepticulæ* seemed scarce; the best species I took was *N. ulmivora*, a pair, in cop., on the aspen tree. *Elachista kilmunella* and *E. rhyncosporella* abounded in the bogs; so did *E. apicipunctella*. Another rather good species, *Laverna lacteella*, turned up; I gave an old stump a heavy knock, and off it came. I did not know my prize until it was set, but thought it was a small *Gelechia tricolorella*. *Thera firmata* were extremely fine in July; so were *Ellopiæ fasciaria* and *Macaria liturata*. In fact all the specimens of last year were larger than usual. I bred several *Polia chi* off *Genista tinctoria*; they are not of the pale type, nor yet the variety *olivacea*, but

between the two. I also met with three *Lithocolletis* new to the district, viz., *L. vacciniella*, *L. corylifoliella*, and *L. scopariella*; the latter I think may prove a new species; it is nothing like my specimen of *L. scopariella*.

15, Spring Bank, Preston; February 24, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 87.)

Grapholita ramella, Linn., = *Paykulliana*, Fab. — Not uncommon among birches in July and August. The larvæ are said to feed in the buds and young shoots of this tree, and should be looked for in April and May. This insect is widely distributed throughout these counties.

G. nisella, Linn. — A very variable species, but though generally distributed, it is not of common occurrence. The imago appears in July and August, and is generally to be obtained by beating. Wilkinson says:—"The larvæ are to be found in the catkins of salows and poplars," and they should be looked for in March and April. I have on several occasions beaten the imago from dogwood (*Cornus sanguinea*) and maple (*Acer campestre*).

G. cinerana, Haw.—Is considered on the Continent as only a variety of the preceding species, and this opinion has been endorsed by Doubleday and Mr. C. G. Barrett. In the South of England *nisella* is the commoner, but at Rannock and other northern localities *cinerana* occurs abundantly. Curiously enough, none of the different varieties of *nisella* are to be met with there. The question of *cinerana* being a distinct species must be considered as still open. Wilkinson says:—"The imago appears in July and August, amongst poplars and aspens in the metropolitan district"; and it also occurs at Croydon, Darenth, and Folkestone.

G. nigromaculana, Haw.—Generally abundant among ragwort (*Senecio Jacobæa*) in July and August. The imago flies freely at dusk, and, from its whitish colour, is conspicuous on the wing. The larvæ are said to feed in the roots of ragwort. They are, however, occasionally to be met with in the stems, and I have

also twice reared single examples from collected flower-heads of this plant.

G. subocellana, Donov., = *Campoliliana*, W. V.—Widely distributed throughout, and generally common among tallows. The imago appears in May and June, and specimens are also to be occasionally met with in July and August, but not in sufficient numbers to warrant the opinion that it is double-brooded. It may be obtained freely by beating. The larva feeds on the tallow in the autumn.

G. minutana, Hub. — A local species, but not uncommon where it occurs. The imago appears in July among black poplars (*Populus nigra*), and should be looked for in windy weather at rest on the trunks of the trees or on the sheltered side of any adjacent palings. The larvæ are to be found in May and June, feeding on the buds and young leaves of the black poplar, and preferring large trees. It has been taken at several places round London; Camberwell, Blackheath, and Wandsworth; also at Croydon and Wimbledon.

G. trimaculana, Don.—A very variable species, and abundant everywhere among elm (*Ulmus campestris*) in June and July. The larva is to be found in May feeding in the shoots and rolled-up leaves of the elm, and towards the end of the month the pupæ are to be found in numbers in the same situations.

G. Penkleriana, W. V.—Like the preceding species, is very variable, and also abundant everywhere among alder (*Alnus glutinosa*) and hazel (*Corylus avellana*) in June and July. The imago flies freely at dusk, and may also be readily obtained by beating. The larva is said to feed in the catkins of alder in March.

G. obtusana, Haw. — Not uncommon among oak (*Quercus robur*) and hazel. The imago appears towards the middle of May, and flies freely about an hour before sunset. It occurs at Lewisham, Darenth, near Strood, Tunbridge Wells, and Folkestone; Croydon, West Wickham, and Haslemere; also sparingly at Hastings.

G. nævana, Hub.—Abundant everywhere among holly (*Ilex aquifolium*), the imago appearing in August and September, while the larva may be found in plenty feeding in the young shoots in May and June.

G. geminana, Steph. — A local species, occurring among

bilberry (*Vaccinium myrtillus*). The imago appears in June and July. It has occurred at a single locality in each of these counties, namely, Sevenoaks, near Caterham, and Mr. C. G. Barrett has recorded it from Haslemere. The larva feeds in the autumn and again in the spring, in the tops of the *Vaccinium*, drawing the leaves together. It is closely allied to the preceding species, but the anterior wings are narrower, and have a more silvery appearance. The perfect insects do not vary.

Phleodes tetraquetra, Haw.—Abundant everywhere among birch and alder in April and May. The imago flies freely in the afternoon and also at dusk. The larva is to be found on birch and alder in the autumn.

P. immundana, F. R.—Much scarcer than the preceding species, with which it sometimes occurs. It is also smaller, darker in colour, and the anterior wings are narrower. The imago appears among birch and alder in April, and again in September. The autumn brood is the scarcer, and the specimens are usually somewhat suffused with chocolate markings. It occurs at Lewisham, Darenth, Tunbridge Wells, Folkestone; Croydon, West Wickham; and Tilgate Forest.

P. demarniana, F. R.—Rather an uncommon species. The imago appears in May and June among birch. The larva is said to feed in the catkins in April. The localities are Darenth Wood, near Strood, Tunbridge Wells, Folkestone; Croydon, West Wickham; and Tilgate Forest.

P. crenana, Hub.—A single specimen is recorded by Mr. T. Blackburn (E. M. M., vol. v., p. 23), reared from a pupa obtained by himself when beating near Richmond. Otherwise it is essentially a northern species. Wilkinson says:—"The imago appears in March and April among willows."

Hypermezia cruciana, Linn., = *excacana*, H. S., = *viminana*, Guen., = *augustana*, Wilk.—A very variable species, and generally common among willows, the imago appearing from June to August. The large grey examples with bright red markings are commoner among willows and the larger kinds of willow, while examples reared from various kinds of dwarf willow are more liable to produce grey or dark-coloured specimens. The larvæ feed in April and May in the willow shoots, and are usually to be met with in plenty.

Batodes angustiorana, Haw.—Abundant everywhere in these

counties. The imago appears in July and August, and the sexes are very dissimilar in colour and markings. The larva, which is polyphagous, is to be found in May and June, and is very partial to various fruit-trees, privet, &c.

(To be continued.)

COLEOPTERA IN 1879.

Captured by THOMAS H. HART.

DURING the past year my collecting has of necessity been limited to a very small area, and only on some two or three occasions have I been able to extend my search beyond the southern portion of the Ashford district. Consequently several localities where I have in other years taken good things have either not been visited at all, or else under circumstances that precluded the possibility of my turning the day to good account.

The Geodephaga I found remarkably scarce, some of those species that are usually most abundant being almost absent. In 1876 the pretty *Leistus spinibarbis* abounded to such an extent that it even invaded our dwellings. It was nothing uncommon on retiring to rest to find one capering across the bed, or climbing up the window-curtains. In the church, too, it was seen on more than one occasion mounted on the shoulder of one of the congregation, to the great amusement of the juveniles present. Last year I met with one specimen only. And as much may be said of numerous other common species.

One specimen of *Polystichus vittatus* occurred in a clay bank near where I had previously taken that species in a flood, but a close search for some time failed to produce more. *Badister peltatus* turned up again in the old spot, accompanied by *B. unipustulatus* and *Acupalpus consputus*.* *Dromius nigriventris* was taken in some numbers by beating thatch in November. I was much surprised at the locality, and also at the great variation in the markings of this insect. Several specimens of *Pterostichus picimanus* were washed out in a flood, but *P. inæqualis*, so abundant in 1877, was scarce last year.

The Brachelytra appeared to be more abundant, but I am

* Some years ago I was very much astonished at finding this insect in profusion in a similar locality at Litlington, near Cambridge.—J. A. POWER.

hardly in a position to speak positively as to species. On July 29th, which was one of the few fine days the summer could boast of, a small Staph. (*Othius punctipennis* I believe) was flying in immense numbers about nine a.m. along the lee-side of the railway embankment adjoining my fields. I at first thought them ants, but approaching I found them to be Coleopterous.

The best of my Clavicornes were *Scydmaenus fimetarius* (from a hot-bed), *Dendrophilus punctatus*, *Saprinus immundus* (from a dead rabbit along the coast), *Epuræa decemguttata*, *Cryptarcha imperialis*, *Cryptophagus populi*, and *Mycetophagus quadriguttatus*. Some of the flower-frequenters were unusually plentiful.

The Lamellicornes were generally scarce, *Melolontha vulgaris* and *Rhizotrogus solstitialis* being almost unobserved. The Onthophagi were fairly plentiful, but the Aphodii not nearly so abundant as usual.

Some species of Sternoxi were in profusion, such as *Laeon murinus*, *Corymbites holosericeus*, *Agriotes sputator*, and *A. lineatus*. The male of *Athous longicollis* was also plentiful, but the deceptive female was scarce, probably from being overlooked. The Telephori were fairly plentiful, and the commoner species of Malthodes and Dasytes were abundant. *Priobium castaneum*, *Anobium fulvicorne* (abundant on hop-poles), and *Xyletinus ater* (on oak-fences), were perhaps the best of this section. *Mordellistena abdominalis* occurred on one particular hawthorn bush, but though some dozens were seen it was so active as to prevent my bottling enough for a single row. *Abdera bifasciata* and *Phlaeotrya Stephensi* are the only other species of Heteromera worth mentioning.

Of the Rhynchophora, *Platytarsus echinatus*, *Sitones cambricus*, *Orthochaetes setiger*, *Plinthus caliginosus* (on clay lands), *Eriirhinus festucae*, *Sibynes primitus*, *Ceuthorhynchus echii*, *Ceuthorhynchideus horridus*, *Apion subulatum* (on *Lathyrus pratensis*), *Brachytarsus scabrosus*, *Bruchus lathyri* (*loti*, S. C.), and *Hylesinus oleiperda* were about the best. Weevils were not generally abundant; the *Orchestes alni*, *Ceuthorhynchus assimilis*, *C. quadridens*, and *Ceuthorhynchideus troglodytes* were in the greatest profusion.

Some of the Longicornes, as *Toxotus*, *Strangalia armata*, and *Grammoptera tabacicolor*, were abundant on Umbelliferæ. *Saperda populnea* could also be found in some numbers sitting on the aspen-leaves. *Leptura livida*, usually so plentiful, was not common.

The Phytophaga were, as regards certain species, the most numerous represented of the Order. Visiting a wood near here in search of *Zeugophora flavicollis*, towards the end of September, I found the aspens almost defoliated by *Lina tremulæ*. The insect literally abounded. On one plant of five short stems, the tallest being less than a foot and a half high, were thirty pupæ. Eleven had congregated under one leaf, and nine were attached to one stem. On another stem, about twenty-four inches high, were twenty-six imagos. The beetle was to be found in all stages, from a small larva to the perfect insect. In another wood the aspen was severely attacked by *Phratora vitellina*, assisted by *Crepidodera helxines*, and on the chalk hills I found *Galeruca viburni* equally common on *Viburnum lantana*. My best captures were *Lema puncticollis*, *Phædon cochleariæ* (on water-cress), *Phratora cavifrons* (on aspen), *Crepidodera pubescens*, *Phyllotreta tetrastigma*, *Thyamis femoralis*, *Psylliodes attenuata* (on the hop-plant), and *Cassida nobilis* and *C. hemispherica*.

Amongst some things collected, and given to me unset by a friend, I found *Dermestes Frischii* and *D. undulatus*.

Kingsnorth, Ashford, February 12, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

AMPHYSA PRODROMANA.—I was glad to see the life-history of this species described by Mr. C. S. Gregson (Entom. xiii. 90). A few further notes may be interesting to some of the readers of the "Entomologist." It occurs in this district on the elevated moorlands at Staley-Brushes and elsewhere, near Manchester, in April. The male flies only during the late morning and early afternoon sunshine, and occurs amongst *Calluna vulgaris* and *Vaccinium myrtillus*, which plants I consider to be, probably, its natural food. Towards three or four o'clock they settle on the tips of the twigs, where also the females may be found, and not unfrequently in cop. Later in the day they fall off the twigs or creep down the stems amongst the dead leaves on the ground, and it is then a puzzle to find them. I have taken this species for a number of years, but never in such abundance as on the 21st of April, 1876, when I netted about seventy males, mostly worn, and, by searching on hands and knees, secured one hundred and thirteen

females, mostly in very fine condition. From some of these I obtained a goodly number of batches of eggs, which I forwarded to correspondents whom I thought would be likely to rear it, but I have only heard from Mr. Gregson as being successful. Some years previously I had sent eggs and larvæ to the late Mr. R. S. Edleston, of Bowdon, but did not afterwards learn whether he succeeded in rearing them. The eggs I procured were deposited on the 21st to the 24th of April; those I kept for my own use began to hatch on the 15th of May. The larvæ seemed to take to anything I gave them, bilberry, coltsfoot, knotgrass, plantain, &c., and many of them made up in June on the coltsfoot leaves, and in the calico covering of the box, drawing together small folds by means of a web. The first imagos, two females, appeared on the 18th March following, and to the 3rd of April I had some thirty or forty specimens emerged, about two-thirds of them being females. From these I got eggs, which began to hatch on the 9th May, but owing to continued ill health Entomology lost its charms, and I had been compelled to break up my collection; so the larvæ were neglected, and consequently died. The species was somewhat local. I have since visited the locality where I took so many, and was sadly disappointed on finding the whole of the enclosure a complete wilderness of black burned heath, stems, &c., so the insect will be absent from this particular locality for a long time; it will be years before it can re-establish itself in such numbers as when I last met with it there. On the 26th March last (Good Friday) I visited the moors to try and find what I thought would be a suitable place to meet with the insect during the present month (April), but was unsuccessful, the moors were smoking and blazing away in a dozen or more places at once, and this continued all through the day. The burning of the vegetation of the moors, so destructive to insect life in all stages, is done I believe that it may spring up again young and fresh to afford nicer food for the moorgame (grouse), which birds are a great source of annoyance to entomological collectors. They are so very noisy if you chance to disturb them, with their loud whirr and plaintive cry, sounding like "go back, go back," which seems to remind you that you are committing serious trespass. The burning of the moors periodically, the grouse, and the keepers are great hindrances to our plentiful capture of *Amphysa prodromanu* and

other local species in this district.—JOHN S. WHITE; 15, Medlock Road, Droylsden, near Manchester, April 2, 1880.

DESCRIPTION OF THE LARVA OF *CIDARIA FULVATA*. — So far as I know there is no English description of the larva of this common species; it may therefore be advisable to publish one. My first acquaintance with it was on June 16th, 1877, when, on the occasion of an excursion of the Yorkshire Naturalists' Union to Sharlston, near Wakefield, I beat one out of a rose bush. Since then I have found it easily enough. Length about five-sixths of an inch, and of average bulk in proportion. Head rather narrower than the second segment; it has the lobes rounded, and when at rest appears to be notched on the crown: the notch, however, is really on the second segment, being formed by an extension of the skin into two prominences above the top of the head, and thus forming the notch. Body of nearly uniform width, rounded above and below, but the two portions divided by a wrinkled lateral ridge; the skin also has a wrinkled appearance, and the segments are very distinctly divided. Head and the ground colour of the body uniformly bright pale green; dorsal stripe composed of a double grey line; subdorsal lines of the same colour, but more boldly defined; a yellow margin forming the spiracular line extends along the lateral ridge; and the segmental divisions are also yellow. Ventral surface, legs, and prolegs bright pale green, the posterior segments yellower, and all the segmental divisions yellow. On the 25th of the same month the larva changed to a pupa amongst the leaves of its sprig of rose; this was about three-eighths of an inch long, the colour almost uniformly of a dull green. From it an imago emerged on the 13th of the following month.—GEO. T. PORRITT; Highroyd House, Huddersfield.

SMERINTHUS POPULI (hermaphrodites).—Amongst a number of *S. populi* I am now rearing from pupæ, I find two hermaphrodite specimens having each a male and female antenna. One of these is depositing eggs.—EDMUND SHUTTLEWORTH; 59, Charlotte Street, Portland Place, W., April 16, 1880.

CAPTURES AT TORQUAY.—During March I searched for larvæ of *Stilbia anomala* and *Heliophobus hispidus*, for the first time this year, expecting to find them nearly full fed and in some abundance. I was greatly mistaken, for we only found one

S. anomala and not more than ten *H. hispida*, none of them being more than half fed. The larvæ of *Agrotis lucerneæ* were also very scarce, but they were most of them nearly full fed. *Epunda lichenea* and *E. nigra* were in more abundance than any of the above-mentioned larvæ; but they were very small, the *E. nigra* evidently having only just turned out from the ova. The larvæ of *Triphæna fimbria* and *Noctua glareosa* were more abundant than usual. The sallow bloom this year, here, has been very much spoilt by the rain, but yielded plenty of common moths, such as *Tæniocampa gothica*, *T. stabilis*, *T. cruda*, and one *Trachea piniperda*. On 13th April we got a fine pair of *Arctia fuliginosa* which must have only just emerged from the pupa.—CHARLES WINN; Kettlethorpe Hall, Wakefield.

OBITUARY.

DR. SAMUEL CONSTANT SNELLEN VAN VOLLENHOVEN.—Science has just suffered a great loss by the death of Dr. Samuel Constant Snellen van Vollenhoven; who died at the Hague, on the 22nd of March last. This well-known naturalist was born at Rotterdam on the 18th of October, 1816. After taking his degree at the University of Leyden, he went to reside at the Hague, with the intention of practising at the bar. This career, however, seemed to have but little attraction for the young barrister, who had from his early youth shown a very decided taste for the study of natural science. After a two years' residence at Leyden, he took up his residence in the country, at Glephawe, near Heemstede, and devoted himself more especially to the study of insects, a catalogue of Netherland Coleoptera being the first fruit of his work in this direction. On the establishment of the Netherland Entomological Society, in 1845, he became one of its first members, and in 1852 he was elected its president, which office he retained, with a short interval, up to the time of his death; and it may be said that the high position occupied by this society, both in the Netherlands and abroad, and the value attached to its Transactions, are in a great measure due to the exertions of its late president. In former years the whole of the collection of Invertebrata in the Museum of Natural History at Leyden was placed under the care of one person, but

in the year 1854 it was resolved to appoint a separate curator for the entomological department, and Dr. Snellen van Vollenhoven was appointed to the post. He retained this appointment for nineteen years, and they who have had the opportunity of inspecting the treasures of that collection will be best able to testify to the value of the labours of its late curator. Unfortunately, in the year 1873, the state of his health obliged him to relinquish this post. Dr. Snellen van Vollenhoven was the author of numerous scientific works on Entomology: these were nearly all illustrated by plates of great excellence from his own drawings. Among his principal works may be mentioned:—‘Hemiptera-Heteroptera Neerlandica,’ ‘Essai d’une faune Entomologique de l’Archipel Indoneerlandais,’ ‘Schetsen ten gebruike, bij de Studie der Hymenoptera,’ and ‘Pinacographia,’ the latter work, of which but eight parts appeared, being an illustrated description of the Ichneumons of North-West Europe. To these were added numerous important papers in the Transactions of the Netherland Entomological Society, and contributions to the continuation of Sepp’s well-known work on the butterflies of the Netherlands, which he edited up to the time of his death. His life-histories of sawflies are well known to British entomologists, a considerable part of this work having been translated in the pages of this periodical. Among entomological works of a more popular character may be mentioned his ‘Gelede dieren van Nederland,’ and a volume on the metamorphoses of insects. His last work was a biography of P. Lyonet, which appeared last year in the ‘Album der Natuur.’—J. W. M.

Besides the lamented Dr. van Vollenhoven we regret to notice the deaths of the following eminent entomologists:—

LEOPOLD KIRCHNER, the Bohemian hymenopterist, died at Kaplitz on the 29th of last December. He was the author of the ‘Catalogus Hymenopterum Europæ,’ which was issued under the auspices of the Vienna Natural History Society. The necessity for this work is shown by its being already out of print, although only published in 1867. Its use, however, would have been greater if it had been more carefully compiled, as in many families it is a mere alphabetical list of used names, without any attention to synonymy; obsolete and duplicate genera also frequently find a place. Records of parasitism and geographical

distribution of the species are attempted, but not much progress is made. Kirchner wrote a list of the Hymenoptera of his district, published in the 'Verhandlungen' for 1854, and "The galls of the Budweiss district" appeared in the Prague 'Lotos' for 1855. Kirchner practised as a Doctor of Medicine at Kaplitz, and as he received his diploma (Vienna) in 1830 he must have attained the allotted three score years and ten.

JEAN-BAPTISTE ALPHONSE DECHAUFFOUR DE BOISDUVAL died the day after Kirchner (December 30th). He also was a Doctor of Medicine, and an eminent and veteran entomologist. Being born in Normandy, where he also died, at Ticheville, near Vimoutiers, in the last year of the last century, he thus outlived the allotted term by ten years. Dr. Boisduval was known here almost exclusively as a lepidopterist; but in earlier life he seems to have paid some attention to Coleoptera, and allied himself both with Lacordaire (1835) and Dejean (1833) in their respective publications on that Order. As a lepidopterist, Boisduval is well known as the author of many valuable works and memoirs. The latter were mostly published in the French 'Annales,' though three of his later memoirs appeared in the 'Annales' of the Belgian Entomological Society. Of both of these societies he was an honorary member; of the Belgian since 1860; and of the French since 1866. He was an original member (1831) of the French Society, and was also a member of the Botanical Society of France, and of the Horticultural Society of Paris. Of Boisduval's works three are tolerably well-known in this country: they are his 'Genera et Index methodicus' (1840); the 'Collection iconographique et historique des Chenilles d'Europe' (1832—1837), by Boisduval, Rambur, and Graslin; and the 'Species général des Lépidoptères' (1836—1874) by Boisduval and Guenée. In Dr. Boisduval, the friend of the illustrious Latreille, who died in 1833, we lose a valuable link with the past.

ETIENNE BERCE also died, at the age of seventy-seven, on December 29th last. Berce was a student of both Coleoptera and Lepidoptera, and is well known as the author of several French works on Lepidoptera; especially of that part of the French fauna, four volumes published from 1867 to 1871, which contain forty-nine coloured plates. This work is spoken of by 'Le

Naturaliste' as "l'œuvre la plus complète et la plus consciencieuse qui ait été imprimée sur ce sujet." He was elected a member of the French Entomological Society in 1835, and was a frequent contributor to its 'Annales.'

J. S. KNATECK, of Berlin, the Enghadine collector, mentioned by Stainton, died at Sils-Maria on 26th January last, aged seventy-nine years. See Ent. Nach., vi., 61.

ERNST AUGUST HELLMUTH VON KIESENWETTER, of Dresden, the eminent coleopterist, has been carried off in the sixtieth year of his age. He contributed many important articles to the various German and French entomological serials, dating as far back as 1842. Several of these memoirs were monographs of genera, e. g., *Hydræna*, *Heterocerus*, *Malthinus*, &c. Von Kiesenwetter was one of the four authors of the 'Naturgeschichte der Insecten Deutschlands: Coleoptera.' He was a Privy Councillor of the King of Saxony.

DR. JOHANN GEORG HAAG-RUTENBERG, the Frankfort coleopterist, died on 20th November, 1879, aged forty-nine years. George Haag was the author of many papers in the Berlin 'Zeitschrift' and Stettin 'Zeitung'; his revision of the *Cantharidæ* (S. e. Z., xl., 249—275, 287—314, 513—519) remains unfinished. See Stett. ent. Zeit., xli., 111.

CAMILLO RONDANI, the eminent dipterist, died last autumn, 18th September, 1879, at Parma, his native city, where he was president of the "Istituto Tecnico." He published many memoirs on Diptera, both European and exotic, but has left his great work 'Dipterologiæ Italicæ prodromus' unfinished, eight volumes having, however, appeared (1856—1877). He was vice-president under Targioni-Tozzetti, and an original member (1869), of the Italian Entomological Society, in whose 'Bullettino' he published many various memoirs, notably his "Degli insetti parassiti" in volumes three to eight. Also, as in other serials, many papers on the various families of Diptera. He was seventy-two years old when he died.

The loss of these honoured entomologists will be felt by students of almost every Order of Insects; but let us hope that some of our readers are qualifying to stop the gaps thus left.—E. A. F.

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LOCALITIES FOR BEGINNERS.

By JOHN T. CARRINGTON, F.L.S.

No. VII.—PINNER.

SOME thirteen or fourteen miles north-west of London, a little beyond classical Harrow, on the London and North Western Railway, is Pinner Station, which may be reached by frequent trains from Euston Station.

Leaving the railway we take the road west of the station, and shortly pass the "Railway" Inn. To our right, in the distance, we see some wooded hills. Our business is to try and find out what insects those woods produce. Following the road, we come in about ten minutes to a park paling, enclosing a park with an old moat in it. By the sides of the moat are some alders. This park fence is about a mile in extent, but only a part of it stands in our direct road. It is overhung with wych elms, beech, oak, firs, &c. With a suitable wind and a dull morning this fence will repay the time spent in examining it, for Lepidoptera at rest thereon. Following it round brings us to Moss Lane, a nice old bye-lane, good for Geometers, &c., which may be taken at dusk, or disturbed with the beating-stick during the daytime. It is not now our intention to go all the way round, but to continue the road by which we came. Passing a guide-post on our left we shortly come to the end of Waxwell Lane, which may be known by a few lime trees around a well. Opposite is a cottage, with a gate to the left. Passing over the stile here we follow the path by the tall hedge on our right. If it be in its season, we may find the webs of *Eriogaster lanestris* larvæ, often in abundance.

We come, at the end of the hedge, to some isolated oaks, good for pupæ digging. At the roots we are pretty well sure to find pupæ of *Agriopis aprilina* about the end of July. In the fields to the left, which are upon a subsoil of chalk, we may get the two blues which frequent such places, *Lycæna Adonis* and *L. Corydon*. We now cross a field and join a broader path. On the left here are more isolated oaks. Opposite these oaks we must be careful not to miss the little white gate to the right, which leads us through Pinner Hall farmyard. We take our way through a gate between some buildings, and so follow the path until we come to a little coppice on our right. Here may often be heard the sweet warble of the nightingale as we pass; but we must not delay here, for we can better spend our time farther on. Passing two or three fields surrounded with fine tall old hedges, which are quite a characteristic of the neighbourhood, we come to Oxhey Lane. The path we have been following is one leading from Pinner to Watford; it here crosses the lane, but we will now leave it and turn to our left up the lane towards the woods, which we see now within a few minutes' direct walk. It will, however, take us longer to get up to them, for we are now in one of the most entomological-looking lanes in the district. Numbers of oak trees, three or four deep, growing in a coppice on each side of the road, make this a most likely and convenient place for sugaring. Amongst the plants and shrubs are *Stachys*, *Angelica*, *Galium*, *Lychnis diurna*, stitchwort (*Stellaria holostea*), wild roses, honeysuckle, dogwood, maple, and many others. When we get to the top of the lane we find a gate leading into the wood. Before entering we see on each side rough fields, in which may be taken *Argynnis Paphia*, *A. Aglaia*, *A. Adippe*, *A. Euphrosyne*, and *A. Selene*. Besides these are the common day-flying moths, with plenty of Tortrices and Tineina.

The wood we are now entering is Oxhey Wood; Pinner Woods are to the left. I will give a short description of these woods, which will serve for the whole, which are of very considerable extent, and are all adjoining. The trees are chiefly oaks, which are some fifty or sixty years old; but the undergrowth is very varied, both in species of shrubs and plants and in age, according to the part of the wood where we may be. This undergrowth seems to be periodically cleared in patches, leaving only the large

trees standing. It consists of sallow, birch, bramble, hazel, poplar, wild cherry, dogwood, ash, dewberry (*Rubus cæsius*), &c. In spring the cleared portions present a very beautiful appearance. Blue with wild hyacinths (*Endymion nutans*) and common bugle (*Ajuga reptans*), these are mixed with wood spurge (*Euphorbia amygdaloides*), dwarf honeysuckle, common ferns, and beautiful patches of the lovely little germander speedwell (*Veronica Chamædrys*)—

“Not for thy azure tint, though bright,
Nor form so elegantly light,
I single thee, thou lovely flower,
From others of the sylvan bower.
Thy name alone is like a spell,
And whispers love in ‘Speed thee well.’”

In May and June a sharp look-out should be kept for the large clear-winged moths, *Macroglossa fuciformis* and *M. bombyliiformis*, feeding on the bugle flowers. The latter is less likely to occur than the former, although the food of its larvæ, the devil’s-bit scabious (*Scabiosa succisa*), grows plentifully in places.

Returning to the gate, through which we have just entered the wood, we pass along the broad path, noting the fine sugaring ground this would make; in fact, the whole wood seems most suitable for sugaring. A dozen or twenty entomologists could sugar with comfort at one time in these woods, and barely see one another during the evening. We shortly come to a fairly good road, which runs through the wood at right angles north and south. This road leads to Oxhey Hall, and on to Watford. This and other roads are marked, “No thoroughfare,” but I do not think there is any difficulty in using them; at least, a keeper whom I met one day this week made no remark, but looked as though he had never before seen a butterfly net.

To the right of where we join this road is a fine stretch of woodland, with some larch and spruce firs in one corner, and a quantity of dwarf hornbeam farther on. I will now leave the entomologist to wander at his will, and to catch all he can until tired, when he must meet me again at the point where we parted, by the corner of the field which is cleared in the wood. We will now make our way by another route towards the station; it is by turning to the south along this road through the wood. In about a quarter of an hour it brings us clear of the Pinner Woods through a high gate, with a cottage to the right and a lodge to the left of us as we emerge.

We cannot well leave this spot without for a moment stopping to admire the beautiful view. High in front of us is the broad valley of the Thames, with "fair Middlesex" at our feet; this is backed by the Surrey hills, some twenty-five miles away in the distance. One of the first objects which catches the eye is a large sheet of water a couple of miles to the right of where we stand. This is Ruislip Reservoir, which belongs to the Regent's Canal Company. It is about eighty acres in extent, and is surrounded by Ruislip Woods, which seem so extensive that we resolve some day to explore them.

The lane to our right leads back to another part of the woods, where, I hear, the bilberry grows; but we must leave that for another day, and go down the hill where the road dips between high banks and hedges, which should be well examined for Tortrices in summer. A little farther on I had this week the pleasure of finding the larvæ of *Ebulea stachydalis*, one of our rarest Pyralides, feeding on the foul-smelling woundwort (*Stachys sylvatica*), which grows in little patches in the hedges on each side of the road. This would indicate the possibility of two broods annually of that lepidopteron.

At the bottom of the hill is a guide-post, and opposite to our right is a lane with whitethorn hedges of great size, quite twenty feet in height. From these the larvæ of several Tortrices may be beaten, as well as that of *Eupithecia exiguata*. Returning to the guide-post, up the Pinner lane, we see to the left a considerable wood of larch, spruce, Scotch fir, &c. This should be tried if time permits. Continuing along this lane brings us to the high road which we left in the morning from the station. But we turn a short distance to the right to the "Bell" Inn for refreshment before starting for the station, which is about a twenty minutes' walk away.

The district I have just described seems to have been little visited by London, or indeed any, entomologists. I made frequent inquiries if butterfly-catchers ever came that way, but none of the residents had ever seen them. A policeman volunteered that he had never seen one, but frequently "bird-catchers," whom, he said, came from Uxbridge. To him the two pursuits seemed much akin, and he seemed to look upon either with the same amount of respect.

The soil of the neighbourhood is light clay, gravel, and sand,

with a subsoil of chalk, which here and there comes close to the top, when the plants peculiar to that formation show themselves, the traveller's joy (*Clematis*) being one of these. The country is undulating, and in places decidedly pretty, affording some nice sunny slopes, on which good collecting may be expected.

I have not enumerated a list of the Lepidoptera taken in the Pinner district for the simple reason that, so far as I can find, it has been little worked. I am told that some years ago the following butterflies were taken in the woods:—*Apatura Iris*, *Thecla quercus*, *T. betulæ*, five species of the genus *Argynnis*, several *Vanessidæ*, *Limenitis Sibylla*, *Arge Galathea*, &c. Amongst moths, where the wood spurge is common, *Minoa euphorbiata* is sometimes abundant. I saw myself, on a recent visit, amongst other species, *Cidaria silaceata*, which I should expect to find, on a favourable day, in some numbers, for the food of its larva (*Epilobium*), is common over the whole woods. I much wonder that so fine a district, which is so comparatively close to London, has been so little worked; but I hope before long to receive, for this magazine, from some of our readers a good account of work done there.

Royal Aquarium, Westminster, S.W., May 22, 1880.

A CONTRIBUTION TOWARDS A LIST OF IRISH SPIDERS.

By THOMAS WORKMAN.

FROM the time that Dr. Templeton, in the first quarter of the present century, collected and described several species of Irish spiders, the results of which are embodied in Mr. Blackwall's well-known work, 'The Spiders of Great Britain and Ireland,' there seems to have been no observer until the Rev. O. P. Cambridge, to whom I owe a deep debt of gratitude, asked me to collect for him in the spring of 1877.

Working as steadily as circumstances would permit from that time until now, I have been able to add considerably to the number of known species.

Mr. Blackwall enumerates forty-three species as found in Ireland; and Mr. Cambridge, in his work just published, 'The Spiders of Dorset,' gives three more, so that, with the sixty-five

species that I have found, one hundred and eleven is the total number of our Irish species so far as known.

It is probable that one collecting in the South or West of Ireland would be rewarded for his labour by a more numerous list of species than is to be found in the more northerly parts, and more especially if one considers that the species already found in Great Britain amount to upwards of five hundred.

It may be remarked that there is considerable doubt about some of Dr. Templeton's species, as the types were deposited by that gentleman in the Belfast Museum, and have long since disappeared.

For the preservation of spiders in the cabinet, I of course use spirits of wine, but place my specimens in flattened phials, in which the spider appears to better advantage, though not quite so convenient for taking out and examining as by Mr. Cambridge's method of test-tubes, stopped with a pledget of cotton, and then placed in stoppered bottles with spirits of wine.

In the following list, I have adopted the classification as given by Mr. Cambridge. It contains all the species, as far as I can find, that have been observed in Ireland; and nearly all are from the neighbourhood of Belfast, in the counties of Antrim and Down.

Only two appear to be new to science, namely, *Erigone improba*, Camb., and *Linyphia subnigripes*, Camb., though some are rare in England, and I believe the two species of *Dysdera*; *D. Cambridgii*, Thor., and *D. crocata*, C. Koch, have not hitherto been found in Scotland.

Class ARACHNIDA.

Order ARANEIDEA.

Fam. DYSDERIDES.

Genus DYSDERA.

Dysdera Cambridgii, Thor. Glenarm; Eden, Carrickfergus.

D. crocata, C. Koch. Kircubbin, Co. Down.

Genus HARPACTES, *Templ.*

Harpactes Hombergii, Scop. Generally distributed, but not plentiful.

Genus SEGESTRIA, *Latr.*

Segestria senoculata, Linn. Everywhere under stones, &c.

Genus OONOPS, *Templ.*

Oonops pulcher, *Templ.* Not uncommon in fir trees and coarse grass near the sea.

Fam. DRASSIDES.

Genus PROSTHESIMA.

- Prosthesima Petiverii*, Scop. Near Dublin. By Dr. Templeton.
P. nigrita, Fab. Sand-hills, Giant's Causeway.

Genus DRASSUS, Walck.

- Drassus lapidicolens*, Walck. Everywhere under stones.
D. ? ferrugineus, Bl. Ireland. On authority of Blackwall.
D. cupreus, Bl. Ireland. On authority of Blackwall.

Genus CLUBIONA, Latr.

- Clubiona comta*, C. Koch. Sparingly under fir trees; Colin Glen, Belvoir Park, and Stranmillis.
C. neglecta, Camb. Under stones; Islandmagee; Black Mountain?
C. reclusa, Camb. In low bushes; Colin Glen.
C. pallens, C. Koch. Colin Glen.
C. holosericea, De Geer. Belfast; Glenarm.
C. terrestris, West. Ireland; Islandmagee? On authority of Blackwall.
C. ? formosa, Templ. Ireland. On authority of Blackwall.

Genus AGROECA, Westr.

- Agroeca proxima*? Camb. One specimen at Cave Hill.

Fam. DICTYNIDES.

Genus DICTYNA, Sund.

- Dictyna uncinata*, West. One specimen; Belfast.

Genus AMAUROBIUS, C. Koch.

- Amaurobius fenestralis*, Storm. Everywhere.
A. similis, Bl. Outhouses.
A. ferox, Walck. Near Dublin. By Dr. Templeton.

Fam. AGELENIDES.

Genus ARGYRONETA, Latr.

- Argyroneta aquatica*, Clerck. Lurgan demesne.

Genus CRYPHÆCA, Thor.

- Cryphæca silvicola*, C. Koch. Colin Glen.

Genus TEGENARIA, Latr.

- Tegenaria atrica*, C. Koch. Near Dublin. By Dr. Templeton.
T. Derhamii, Scop. Common.

Genus TEXTRIX.

- Textrix denticulata*, Oliv. Giant's Causeway, under stones.

Genus AGELENA.

- Agelena labyrinthica*, Clerck. Ireland. On authority of Blackwall.
A. ? Hyndmanii, Templ. Ireland. On authority of Blackwall.

Fam. THERIDIIDES.

Genus PHILCOMMUM, Thor.

- Philcommum gibbum*, Westr. One specimen, female. Colin Glen.

Genus *THERIDION*, Walck.

- Theridion tepidariorum*, C. Koch. Common in greenhouses.
T. sisyphium, Clerck. Common.
T. denticulatum? Walck. Windsor, Belfast.
T. varians, Hahn. ?
T. simile, C. Koch. ?
T. rufolineatum, Luc. ?
T. pulchellum, Walck. ?
T. bimaculatum, Linn. ?
T. pallens, Bl. Belvoir Park.
T. ? auratum? Templ. On authority of Blackwall.

Genus *PHYLLONETHIS*, Thor.

- Phyllonethis lineata*, Clerck. Common.

Genus *STEATODA*, Sund.

- Steatoda ? hamatostigma*, Templ. On authority of Blackwall.

Genus *ERIGONE*, Sav.

- Erigone longipalpis*, Sund. Glastry, Co. Down.
E. promiscua, Camb. Islandmagee.
E. dentipalpis, Reuss-Wid. Giant's Causeway.
E. rubens, Bl. Colin Glen, Belvoir Park.
E. isabellina, C. Koch. Colin Glen, Belvoir Park.
E. Huthwaitii, Camb. Glastry, Co. Down.
E. improba, Camb. Belfast.
E. bituberculata, Reuss-Wid. Belfast.
E. livida, Bl. Islandmagee, under stones.
E. rufipes, Sund. Portavoe.
E. albipunctata, Camb. ?
E. fuscipalpis, C. Koch. ?
E. agrestis, Bl. Ireland. On authority of Rev. O. P. Cambridge.
E. retusa, West. Ireland. On authority of Rev. O. P. Cambridge.
E. Sundevallii, West. Ireland. On authority of Rev. O. P. Cambridge.
E. ? pilosa, Templ. On authority of Blackwall.
E. ? pallidula, Templ. On authority of Blackwall.
E. ? carinata, Templ. On authority of Blackwall.

Genus *WALCKENÆRA*, Bl.

- Walckenæra bifrons*, Bl. One male among stones; Islandmagee.
W. erythropus, West. Two or three specimens, males; Kircubbin and Islandmagee.
W. permixta, Camb. Portavoe.

Genus *PACHYGNATHA*, Sund.

- Pachygnatha Clerckii*, Sund. One specimen, Colin Glen; three, Belvoir Park.
P. Listerii, Sund. On authority of Blackwall.
P. Degeerii, Sund. Common under stones, &c.

Genus *LINYPHIA*, Latr.

- Linyphia thoracica*, Reuss-Wid. Colin Glen, Islandmagee, Marlborough Park.

- Linyphia leprosa*, Ohl. Islandmagee, Portballintrae.
L. minuta, Bl. Stranmillis, Colin Glen, Islandmagee.
L. subnigripes, Camb. Female; Windsor, Belfast.
L. luteola, Bl. Colin Glen.
L. nigrina, West. Colin Glen, Belvoir Park.
L. pullata, Camb. ?
L. dorsalis, Reuss-Wid. Portballintrae, Marlborough Park.
L. circumspecta, Bl. Islandmagee.
L. bicolor, Bl. Colin Glen, Islandmagee.
L. cristata, Menge. Stranmillis, Colin Glen.
L. parvula, West. Islandmagee.
L. concolor, Reuss-Wid. Islandmagee.
L. insignis, Bl. Belvoir Park.
L. clathrata, Sund. Colin Glen.
L. zebrina, Menge. Colin Glen, Islandmagee.
L. triangularis, Clerck. Common; Colin Glen, Islandmagee.
L. montana, Clerck. Belvoir Park.
L. pusilla, Sund. Colin Glen, Islandmagee.
L. hortensis, Sund. Kircubbin.
L. ? nasata, Templ. Crammore.

Genus *ERO*, *C. Koch.*

- Ero thoracica*, Reuss-Wid. Colin Glen.

Fam. *EPEIRIDES*.Genus *META*, *C. Koch.*

- Meta segmentata*, Clerck. Very common.
M. Merianæ, Scop. Not so common; Portballintrae, Islandmagee.

Genus *TETRAGNATHA*, *Latr.*

- Tetragnatha extensa*, Linn. Very common.

Genus *ZILLA*, *C. Koch.*

- Zilla x-notata*, Clerck. Common.
Z. atrica, *C. Koch.* Common in Colin Glen in Autumn.

Genus *EPEIRA*, *Walck.*

- Epeira cucurbitina*, Clerck. Not uncommon at Glenarm.
E. diademata, Clerck. Very common.
E. cornuta, Clerck. Portballintrae, Kircubbin.
E. quadrata, Clerck. Co. Kerry.

Fam. *THOMISIDES*.Genus *XYSTICUS*, *C. Koch.*

- Xysticus cristatus*, Clerck. Common under stones.

Genus *OXYPETALA*, *Sim.*

- Oxypetala horticola*, *C. Koch.* One specimen; Colin Glen.

Genus *PHILODROMUS*, *Walck.*

- Philodromus aureolus*, Clerck. Stranmillis.

Fam. LYCOSIDES.

Genus PIRATA, *Sund.*

Pirata piraticus, Clerck.

Genus TROCHOSA, *C. Koch.*

Trochosa picta, Hahn. On sand-hills near sea, Giant's Causeway, Portavogie.

T. ruricola, De Geer. Common under stones.

T. terricola, Thor. Common under stones.

Genus LYCOSA, *Latr.*

Lycosa annulata, Clerck. Very common on old pasture-land.

L. pullata, Clerck. Islandmagee.

L. nigriceps, Thor. Islandmagee.

L. palustris, Linn. Islandmagee, Belfast Harbour.

Genus TARENTULA.

Tarentula pulverulenta, Clerck. Co. Kerry, Islandmagee.

Fam. SALTICIDES.

Genus EPIBLEMUM.

Epiblemum scenicum, Clerck. Near Dublin. By Dr. Templeton.

Genus HELIOPHANUS, *C. Koch.*

Heliophanus cupreus, Walck. Portballintrae, island in Strangford Lough.

Mr. Cambridge, in his work already referred to, says that *Amamobius similis*, Bl., found so abundantly in England, has not yet been observed on the Continent; but I have within the last few days seen specimens found near Hamburg, where Mr. Bösenberg says it is not uncommon.

Bedford Street, Belfast, May 3, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

By WALTER P. WESTON.

(Continued from p. 112.)

Pædisca bilunana, Haw.—Common everywhere among birches, and generally distributed. The imago appears in June, and is to be reared from catkins collected in March and April.

P. oppressana, Treit.—A local and uncommon species. The imago occurs in June, and is usually to be met with on the trunks of Lombardy poplars, in the bark of which the larva feeds. The species has occurred at Willesden and Folkestone.

P. corticana, W. V.—Abundant everywhere among oaks in July and August. The imago varies from drab to black, including green, olive, and fuscous forms. The larva feeds on the oak.

P. profundana, W. V.—Distributed throughout among oaks, but not so common as the preceding species. The imago appears in July and August, and is very variable. The larva is to be met with in May and June.

P. ophthalmicana, Hüb.—An uncommon species; the imago appearing in August and September among poplars and aspens. It has occurred in each of these counties, but the localities are limited: Strood, Folkestone; Lewes; Croydon and Wimbledon.

P. occultana, Doug.—Local and rare in these counties. It has occurred at Birch Wood; Brighton; and near Weybridge. The imago appears in June and July, and is to be met with among larch and fir trees.

P. solandriana, Linn.—Common throughout. The imago appears in July and August, and may readily be obtained by beating. The larva feeds on birch, hazel, and I have found it commonly on *Cornus sanguinea*. It is a variable species, but yet constant in its variations.

P. semifuscana, Haw.—Widely distributed throughout among willows; the imago appearing from July to October, and may be taken on the wing at dusk, and also at light. The larva feeds on the willow in June. This species may be distinguished from *P. solandriana* and *P. sordidana* by its more shining appearance, and the silvery whitish colour of its hind wings.

P. sordidana, Hub., = *stabilana*, Steph.—Distributed, but local. The imago is of a dull brown colour, and more constant than either of the preceding species. It appears in September and October, and is not uncommon among alders, upon which the larva feeds.

Ephippiphora bimaculana, Don.—Distributed and not uncommon among birches, especially in heathy places. The imago appears from July to September. The larva is to be found in the shoots in the spring.

E. cirsiaria, Zell.—Not uncommon among thistles in marshy places, and generally distributed. The imago appears in June and July, and may be captured on the wing at dusk, but it is not a free flyer. The larva feeds in the stems of thistles (*Carduus palustris*), and also of *Centaurea nigra*, in the autumn and following spring.

Both the larva and imago of this insect are very similar to the following species, but rather smaller; the imago is also darker, and later in appearance.

E. pflugiana, Haw., = *sticticana*, Steph., = *scutulana*, Wilk.—Much commoner than the preceding species. The imago appears in May and June among thistles, in the stems of which the larva feeds. Its habits are similar to those of the preceding species.

E. Brunnichiana, W. V.—Abundant throughout, wherever its food-plant, coltsfoot (*Tussilago farfara*), occurs. The imago appears from the end of May to August. The larva feeds in the flower-stems of the coltsfoot in the early spring.

E. fœneana, Linn.—Local, but not uncommon where it occurs. The larva feeds in the autumn and following spring in the roots of mugwort (*Artemisia vulgaris*); and the imago is to be met with in June and July. It occurs along the Kentish bank of the Thames; also at Darenth.

E. nigricostana, Haw.—A local and uncommon species. The imago appears in June and July among hedge woundwort (*Stachys sylvatica*), and may be taken on the wing in the afternoon. The larva feeds in the autumn and following spring in the roots of that plant. The insect has been taken near Hastings; Haslemere, Croydon, Wimbledon, Epsom; Lewisham, Darenth, and Folkestone.

E. signatana, Doug.—Local and uncommon. The imago appears in June and July, and flies somewhat freely at dusk among sloe, *Prunus spinosa*; and it is also said to feed on the wild cherry, *P. padus*. Its capture is recorded from Croydon, Sanderstead, Mickleham; Folkestone, Dover, and Strood. It also occurs at Box Hill, and near Lewes.

E. trigeminana, Steph.—Somewhat local, but generally abundant where it occurs. The imago appears in June and July, and prefers railway slopes and rough broken ground. The larva is said to feed on ragwort (*Senecio Jacobæa*). The imago is common at Croydon, Epsom Downs, Box Hill; Tilgate, Lewes, Hastings; Folkestone, Dover, Strood, and Darenth.

E. tetragonana, Steph.—Local and scarce. The imago appears in July, and should be looked for in the open rides in woods and woody lanes. According to Wilkinson, the larva may be found in the autumn full-fed under moss on beech trees; it hibernates

and goes into pupa in the spring; but Mr. C. G. Barrett is of opinion that the black briony (*Tamus communis*) is its food-plant, for he has always found it amongst that plant. The species has occurred at Haslemere; Tilgate Forest; Folkestone, and in North Kent.

E. populana, Fabr.—An uncommon species. The imago appears in July and August among willows and also blackthorn. The larva feeds in the shoots in May. It has occurred at Darenth, Folkestone; Haslemere, and Croydon.

E. obscurana, Steph., = *gallicolana*, Zell.—Local and rare. The imago appears in May and June, flying round oaks at dusk, and always high. This species may be bred from oak-galls, especially those of *Cynips Kollar* collected in the autumn. It has occurred at Croydon; Darenth; and Tilgate Forest.

E. ravulana, H.-S.—Local and rare. The imago appears in May and June, and flies somewhat freely in the afternoon sunshine. The larva has not yet been discovered. The species was added to our list in 1866, from specimens captured by Mr. E. G. Meek at Darenth; it has occurred several times since in that locality, and has also been taken at Tilgate Forest and Folkestone.

(To be continued.)

URANIA SLOANUS AT HOME.

By P. H. Gosse, F.R.S.

NOTICES of the rarer exotic Lepidoptera, as they appear at home, are not so abundant but that your readers may be pleased to peruse some pen-pictures of the lovely *Urania Sloanus* in its vernal swarming in the Island of Jamaica. Thirty-five years have passed since I was charmed with the gorgeous sight, and I essayed to describe what I had seen in my 'Naturalist's Sojourn in Jamaica,' pp. 69—74. Thirty-five years! 'tis a long time!—

"I ask, Is the nightingale singing there yet?

Are the roses still bright by the calm Bendemeer?"

Are the *Uranie* still glittering in livery of green and crimson and gold in the grand forests of Jamaica? Let me answer in the words of my esteemed correspondents, the Rev. J. L. Mais and

his son, who are sending not only specimens of the charming butterflies of the island for my cabinets, but valuable notices of their life-histories in a series of letters, from which I propose to make a few extracts.

My young friend writes from Walton, Jamaica, on the 9th of March last:—"We have seen several *Uranie*, but all feeding high out of reach. Yesterday, between 5 and 6 p.m., I saw a striking scene: a tree covered with snow-white blossoms, on which swarms of this beautiful insect, and several black and emerald males of the long-tailed humming bird (*Trochilus Polytmus*), were feeding and playing at the same time; the two beauties—the insect and the bird—darting about in all directions, and sucking the white flowers together; a lovely sight, and one never to be forgotten."

A month later the same observer, sending me a consignment of this charming butterfly-moth, in fine condition (now in the hands of Mr. Marsden, Gloucester), remarks:—"The *Uranie* have all been caught within the last fortnight, and so are quite fresh. We caught them feeding on the mango blossom, which just now is in great profusion. . . . It was very interesting, last week, to watch these brilliant creatures hovering round the great dense mango trees, now and then alighting on a flower, and looking, as they projected the long sucking tongue into the corolla, as if they were attached to it by a slender wire. This was in the early day; as soon as the sun became hot, *viz.*, about 10 or 11 a.m., they would pitch on the upper surfaces of selected leaves, always turning head downward, the wings expanded as if in a cabinet; while a few would gaily chase each other around the trees at a height of only a few feet from the ground."

Still more recently Mr. Mais, senior, conveys to me his impressions in like graphic language. On the 21st of April he writes:—"Let me describe a sight that fell under my notice about the end of last month. The weather had been very dry for some weeks, and all our usually green pastures were scorched and brown. The orange and pimento trees drooped and thirsted for rain. The mango trees alone seemed to enjoy the hour, and were a mass of bloom. I had been sent for, to see a sick man in the village, and took a short cut through Rose Hall Pen, halting a moment near a clump of tall mango trees. The air was melodious with the hum of bees and minute insects, intent on

their sweet repast. It was about 5 p.m. My negro pen-keeper joined me at this moment; and, while conversing with him, my attention was suddenly attracted to a mango branch that was hanging not more than six feet from the ground, laden with blossom, and literally alive with some beautiful insect-life. I could not believe my eyes. Though not ten yards from the spot, I thought I must be mistaken. I said to the negro at my side, 'Look there, my man. What are those?'

"'Heigh, parson! Dem is soso-bugs!' he replied, looking astonished.

"'Soso-bugs!' I said, 'why, man, these are the very things I have been looking for day after day.'*

"Sure enough, on closer inspection, they proved to be *Uranie* in the most perfect condition, evidently just emerged from pupa. There were above fifty of them together, in a space of two yards square, flying round and round the branch, some alighting on the leaves and spreading their gorgeous wings, in which the rich velvet-black, the bright emerald bands, and the notch of ruddy gold blend and harmonise so beautifully; others contending playfully in the air for a moment, to return again presently to their evening meal. I had seen *Uranie* on high trees disporting themselves, but never before saw them so near to the ground. Unfortunately I had no net with me. I might have returned for one, but duty urged me away. Within an hour I passed the same spot on my return. Not an *Urania* was to be seen! And though, on the next day, we caught several in the same clump of trees, yet I never saw another on the branch I have described."

I will not risk the spoiling of these delightful pictures by adding a single touch of my own, but leave them in their native beauty.

SOME NOTES ON COLLECTING IN SOUTHERN INDIA.

By EDWIN LESTER ARNOLD.

To the enthusiastic collector India offers a wide and enticing field of operations, especially if he should be a beginner and fortunate enough to be pleased with everything that comes to his

* I have described (*loc. cit.*) the suddenness and the brevity of the seasonal appearance of *Urania*.—P. H. G.

net. In that case there are many localities where he may revel to his heart's content amongst the members of every branch of Entomology, filling his boxes and cabinets with hundreds of butterflies, which, if less bright and gaudy than some of those of South America and the islands of the Pacific, yield the palm in variety and size to none; and, if he is inclined to Coleoptera or Hymenoptera, may bewilder himself with hordes of strange beetles and prismatic-winged bees.

One of the best localities in Southern-India for the naturalist is on the southern slopes of the great Neilgherry Hills, in the Madras Presidency. Here vegetation and insect life are found in zones varying as one ascends from the dense bamboo jungles that clothe the foot of the ghauts, through the thickets of palm, plantains, and *Butea frondosa*, upwards through forests of tall trees, matted together by rattans and flowering creepers, until one reaches the English sanitarium and military station of Coonor, some 8000 feet above the sea-level, with a delightful climate, and a fauna and flora combining the characteristics of temperate and tropical regions.

In this happy hunting ground I recently spent some months to recruit health and strength after a long spell of jungle fever, caught in the jungles more to the southward in Travancore and Cochin while working among the famine-stricken natives of those states. I was considerably surprised to see how much both officers and privates had taken to collecting in the district. In the early morning scores of soldiers, in their light and becoming white and gold "undress" uniform, turn out with nets and boxes, and, until the bugle sounds for parade, the butterflies have anything but a lively time. Every lane is patrolled, every "shola" or patch of brushwood searched, and every flowering shrub guarded by nets of all sizes and colours. The spoil obtained from even a single morning's work is by no means contemptible; the only thing is, the butterflies are often of such large spread of wings that it is difficult to carry them in any ordinary collecting-boxes,—even the inside and outside of a great sun-hat will not accommodate as many as one often takes in a couple of hours.

Amongst the largest of the butterflies common here is the handsome *Papilio Pompeus*, measuring nearly seven inches across the wings, with the upper pair deep velvety black, and the lower

wings satin-yellow, with the veins marked in black. It is a high flyer, and the moment has to be watched for when it comes sailing down in easy circles and alights upon some low-growing shrub, especially *Clematis Wightiana*, on which perhaps its caterpillar feeds, though I have never succeeded in finding it there.

Another large and handsome insect, *Papilio Polymnestor*, is fairly common, but avoids the sunlight, and flutters softly about in the deep gloom of the most secluded groves of fig and mango trees, where it might be mistaken for a huge bat but for the pale lavender colour of its lower wings. When feeding they are so absorbed that they may be taken between the thumb and finger without much difficulty.

But it would be hopeless and very dry reading to enumerate all the species that may be found in the neighbourhood of Coonor. Every collector must hope to make their acquaintance personally some day, and when he does he will probably long remember his first morning in the tropics—an event in one's life which can never be adequately described to outsiders nor ever forgotten by oneself.

Lower down the slopes of the mountains, at an elevation of about 4000 feet, the bamboo jungles commence, and the vegetation becomes strictly tropical and insect life even more abundant than higher up. In these bamboo jungles there are occasional pools surrounded by tall lemon-grass, or swampy places by the side of nullahs or water-courses. These are always very productive localities, but they also harbour snakes, vast numbers of leeches, and very often a tiger or two; so the collector must keep his eyes open. In such a place I have spent the early hours of the day, filling box after box, and, in the excitement of the chase, rushing over the marshy ground and scrambling among the rocks utterly regardless of snakes, tigers, or sunstroke; but I more than once paid the penalty afterwards with an attack of fever.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

POLYOMMATUS HIPPOTHOE AND P. DISPAR.—In No. 23 of 'Le Naturaliste,' published in Paris, March 1st, 1880, some "Notes lépidoptérologiques" are contributed by Mons. R. F. Brown, of Bordeaux. In the first part of his article the author

speaks of the varieties of *Polyommatus Phleas*, *P. Xanthe*, and *P. Gordius*; then he comes to *P. Hippothoë* and *P. dispar*. As is well known to entomologists, in certain double-brooded species, the first brood is sometimes so different, in colour and even in size, from the second, that they seem to be different species. Such is the case with *Araschnia Prorsa*, in the French vernacular called "Carte géographique brune," and *A. Levana*, "Carte géographique fauve." *A. Levana*, the spring form, is the smaller of the two, and the butterfly emerges from the hibernating pupa in May; *Prorsa* makes its appearance about the end of July. During the winter another variety of this genus may be obtained by artificial heat, which again differs from *A. Prorsa* and *A. Levana*; it is then called *A. Porima*, "Carte géographique rouge." *A. Porima* is sometimes found in a state of nature. With respect to *Polyommatus Hippothoë* and *P. dispar*, which are, it would seem, one and the same species, I translate freely from the French a part of Mons. Brown's interesting article. He says:—"As we are now speaking of the genus *Polyommatus*, I would ask in my turn for some information respecting *P. Hippothoë*. This beautiful insect is common in the marshes which extend to the north and north-west of Bordeaux, and also in other directions. It has two generations; the first in May and June, the second in August and September. The specimens of the second brood offer nothing remarkable, and correspond undoubtedly to the type described and figured by Godart in the first volume of his work; it is not so with respect to the specimens of the first brood. The latter answer in size and brilliancy of colours almost exactly to the two figures, and the description given by Duponchel, in his supplement on *dispar*, described later on by all authors, and by Duponchel himself, as being allied to *P. Hippothoë*. M. Gaschet, a lepidopterist of Bordeaux, who possesses specimens of the English *dispar*, finds, it is true, some difference from ours: 'There is something different,' he tells me, 'but very little. For my own part, I, who am entirely disinterested in the matter, find the difference so insignificant as to be almost imperceptible.' I should be interested to hear whether, in the north, as in our country, *P. Hippothoë* is double-brooded, and, if so, why is not the first '*dispar*'? I also ask myself, if the celebrated English *dispar* butterflies were not merely specimens of the first brood, collected

on account of their beauty and high value, while those of the second brood were neglected. It is, at least, what takes place at Bordeaux with respect to *Anthocharis cardamines*, which is double-brooded, on the hills which border the Garonne, at two leagues distance from the city. Collectors in Bordeaux despise the first brood which appears in March and April, because it is smaller and less beautiful, and go in search of the specimens of the second brood, which are remarkable here for their large size and brilliant colouring. Let us suppose *A. cardamines* to be a species in great demand, as collectors say, that is to say, a species for exchange, the Bordeaux 'amateurs' would not fail to despatch specimens in large quantities, as they have done with the unfortunate *A. Belia*, which is ruthlessly hunted every year. The Bordeaux type of *A. cardamines* would not fail to pass as larger and more brilliantly coloured than the specimens of the north, and nomenclators of varieties would not fail to christen it—perhaps '*cardaminoïdes*.' Finally, the foreign 'amateur,' passing through our city, who might think it a great treat to take '*propria manu*' this beautiful variety, would be cruelly disappointed, when going to catch it at the ordinary time the insect makes its appearance, *i. e.*, in April, only to obtain specimens exactly similar to those of his own country. The date given by Duponchel for the emergence of *P. dispar*, according to information sent from England to M. Alex. Lefebvre, is extremely vague; possibly this vague information was given on purpose by English collectors anxious to keep their monopoly. June, July, August, he says. Does that indicate a single generation? Here we take it in June and in August; but, as I already stated, the individuals taken in August are totally different to those taken in June."—ALFRED WAILLY; 110, Clapham Road, London, S.W.

[*P. dispar* was, I believe, not double-brooded in this country. The larva was to be found feeding upon the water-dock, *Rumex hydrolapathum*, in May and June. The imago made its appearance in July and August; there was never any attempt to make a monopoly of the insect, nor to make any mystery as to its time of appearance by the collectors. It was very abundant; and when I first knew the fens, over forty years ago, the imagos were to be purchased from the collectors at from 3s. to 4s. per dozen. I have seen but few specimens of the continental *Hippothoë*, so

am hardly prepared to speak positively as to their identity with our insect, but think they are identical.—F. BOND.]

NOTES ON THE REARING OF CERTAIN HYBERNATING AND OTHER LARVÆ OF BRITISH LEPIDOPTERA.—*Ourapteryx sambucata*.—The larvæ of this moth hibernate easily either in the open air or under cover in a shed or outhouse. If reared in the open air, they should be secured in a strong muslin bag tied to a branch of blackthorn (*Prunus spinosa*), in some sheltered position. If reared under cover, twigs of the same tree should be placed in a wide-mouth bottle filled with water, through a suitable aperture in the cork, and the larvæ secured by muslin tied round the neck of the bottle, and regularly supplied with fresh food so long as a vestige of green foliage is obtainable. Wintering these larvæ, and probably others, in a somewhat darkened place prolongs the period of hibernation, and prevents them wandering in search of food before either the blossom or leaves appear on the blackthorn. This is evident by the partially-denuded spines and branches in the case of those wintered with insufficient shelter. The larvæ of *O. sambucata*, as is well known to entomologists, derive their specific name from the elder (*Sambucus nigra*), though I have never obtained them from that tree. I have, however, beaten them out of whitethorn (*Crataegus oxyacantha*), and frequently out of blackthorn, which latter seems their staple food in this locality. *Lasiocampa quercifolia*.—Feed well on blackthorn, and hibernate so closely attached to the stems as to appear like excrescences of the bark, which they so exactly resemble in colour as to sometimes deceive the most practised eye. The species may be wintered similarly to *O. sambucata*, but they thrive better in the open air in a sheltered position. *Lasiocampa rubi*.—Roll themselves up in rings and hibernate in that state. May be wintered well among heather (*Calluna vulgaris*) and other species of *Ericæ*, sheltered and protected from sunshine as much as possible. A shallow circular wooden vessel, one foot deep and two feet in diameter, filled with mould in which roots of heather have been closely planted, and covered with muslin tied tentwise to a central support, makes an excellent and cheap mode of providing them with winter-quarters. The muslin covering also affords protection to the food-plants by preserving them green throughout the winter, unaffected by frost or snow, and thus ready for the larvæ when

roused into activity by the warmth of spring. *Aplecta nebulosa*.—Hybernate on dock (*Rumex*) planted and protected similarly to the preceding. The folds of the muslin at the apex where tied to the support afford good means of hibernation. *Plusia chrysitis*.—The August or second brood pass the winter in the larval state, and may be easily hibernated on white dead nettle (*Lamium album*) planted in a large-size flower-pot secured by muslin tied round the rim and to a central support. On the approach of winter, the larvæ, which are then about a quarter of an inch in length, cease to feed, and secrete themselves in the folds or curls of the fallen leaves, where they remain dormant throughout the winter. In spring they are tempted from their retreat by the young nettles which spring up from the roots, or until supplied with food obtained from some lane or sheltered hedge-side where vegetation is in a forward state. *Cerigo Cytherea*.—Feed on coarse and fine grasses (*Poa*) throughout the winter, and are full fed the following March or April, when they construct their cocoons among the roots. A garden seed-pan filled with mould in which a sod of turf has been planted, covered and protected as before described, is a most suitable receptacle for these larvæ. It is advisable to examine the turf and free it from predatory insects before placing the young larvæ on the grass. A safe plan is to rear them for a few weeks in a smaller receptacle, and remove them to the larger to complete their growth and transformation to the pupal state.—GEO. J. GRAPES; 2, Pownall Crescent, Colchester.

CATOPTRIA PARVULANA IN ISLE OF WIGHT.—While staying at Freshwater last August I took a fine specimen of *Catoptria parvulana* (female); on the downs. The locality was similar to that described by Mr. Bond of his captures in 1857. There was an abundance of the dwarf thistle (*Cardus acaulis*) growing on the spot, on which Mr. Bond suggested the larva may probably be found to feed.—W. S. RIDING; 25, Endsleigh Gardens, N.W.

NEW LOCALITY FOR COLEOPHORA CONSPICUELLA.—On May 13th I was fortunate in coming across the larva of the above rarity in some abundance. I had been collecting in the neighbourhood of Holmwood, near Dorking, nearly the whole day with very little success; and, as a natural consequence, I was quite tired. So I packed up my traps and made off to the station,

but on arriving there I found I had nearly two hours to wait for a train. I came out and strolled off in quite an opposite direction to pass away the time. I had not been walking more than a quarter of an hour before my attention was drawn to a lot of *Centaurea nigra* growing on a nice sloping bank, the terminal shoots of which plant were screwed up by the larvæ of a *Depressaria*. On getting over the hedge to ascertain whether they were other than *D. liturella*, I saw within a yard of me seven or eight cases of *C. conspiciuella*. My fatigue very soon vanished, for within ten minutes I had taken seventeen cases. I need hardly say I lost my train, and had to go by a later one, but before leaving I had the satisfaction of taking above ninety cases. From their size I am convinced the larva must be nearly full fed. I could have taken many more, but I left the small and medium-sized cases, knowing how difficult the small larvæ are to rear. I took five small ones in the neighbourhood of Cuxton, near Strood, last year, none of which were reared, although I paid every attention to them, but I think I am now in a fair way to obtain a series this year, and I hope many for my friends.—G. ELISHA, Shepherdess Walk, City Road, N.

OBITUARY.

FRANCIS ORAM STANDISH.—It is so seldom that we meet with a case in which for three generations, in one family, there have been collectors of insects, that the fact should be put on record. Mr. F. O. Standish, who was well known as a careful and assiduous lepidopterist, died at Cheltenham, where he had lately lived, on April 12th last. His father was Benjamin Standish, who for sixty summers used to trudge from Camberwell to Darenth and Black Park in search of insects. There was still one generation before him; the three having collected for upwards of one hundred consecutive years. The last, whose death we now record, worked up to within a short period of his decease. One of the latest additions to our list of Lepidoptera, viz. *Eupæcilia gilvicomana*, was discovered by him. His collection, which comprises many of the insects from the cabinets of his ancestors, recently passed into the hands of Mr. E. G. Meek. Mr. F. O. Standish was never married. His age was forty-eight years.—J. T. C.

REVIEWS.

Notes of Observations on Injurious Insects. Report, 1879. London :
W. Swan Sonnenschein & Allen. 1880.

Workers in other branches of Science are apt to look down on entomologists in the light of flycatchers who make mere collections, rather than as students who contribute to the world's knowledge of the creatures they catch. No doubt there is some truth in this accusation; for, after all, there is enough in the beauty of the objects which make up this great division of the Invertebrata to justify one fond of Natural History in forming such a collection. But we should scarcely complain of the collector; for, with the exception of those who have been specially trained from youth to the study of Biology, the men of science have risen from the great body of collectors.

In addition to the accurate knowledge of the life-history and anatomy of any particular group of animals, there is another study, *viz.*, the position an animal bears with regard to man—whether its existence is to his advantage or otherwise in the race for the survival of the fittest. This is the object of the valuable Observations collected through the energy and patience of Miss E. A. Ormerod and her co-workers, the Rev. T. A. Preston, M.A., and Mr. E. A. Fitch, F.L.S. A report of these Observations has been recently issued, and forms an interesting illustrated pamphlet of forty-five royal octavo pages.

The work of obtaining these observations from many and remote parts of the country is necessarily difficult. Prejudice, ignorance and apathy have to be overcome; ignorance no doubt being the chief difficulty. Miss Ormerod has wisely given in the Report now issued woodcuts of life-histories of most of the insects under observation. This will be a great help to others who are willing to report upon, but who were unable to name, the insects, whether larval or otherwise, which have arrested their attention.

In the report for 1879 about eighty species of injurious insects have been under consideration. The Observations have been made in many and widely separate places, extending from the north of Scotland to the south of England. No one can doubt the value of concerted action in getting together a large mass of

material from which Miss Ormerod and her friends unravel the threads which make up the skein of knowledge. We are glad to observe that the Observations extend also to the weather during the time when the occurrences of particular insects were noted. The mere record of an insect being abundant, and damaging or otherwise, amounts to little. Unless some of the surrounding circumstances are also given, we shall never gather the cause or rule for exceptional abundance, or be able to combat our enemies. Our greatest safety will probably be the expectance of a "blight," so that we may provide a preventative rather than a cure after its appearance.

We are pleased to note that political economists, as well as entomologists, have taken notice of the importance of Miss Ormerod's work. Several societies have referred to it, notably at the meeting on May 5th, 1880, of the Royal Agricultural Society of England. At that meeting the chairman referred to an application from Miss Ormerod for the co-operation of the Royal Agricultural Society in respect to the observation of insects injurious to farm crops. He further stated "that the committee hoped that the members of the council of the society would assist Miss Ormerod in her useful work." So thorough and systematic is the work that we cannot forbear supplementing that gentleman's request by one to our readers, to do likewise. Miss Ormerod provides the necessary forms free of expense, and our country readers would do well in distributing them amongst their neighbours who would be likely to collect and return the necessary information for carrying on this interesting work.—J. T. C.

The Geological Antiquity of Insects. By HERBERT GOSS, F.L.S.
London: John Van Voorst. 1880.

In twelve papers upon Fossil Entomology, which are here collected and reprinted, Mr. Goss very fully and in a most lucid manner places his subject before his readers. These papers will repay the time spent in reading them, and we hope they are only an earnest of future work in a field where hitherto there have been but few labourers.—J. T. C.

ERRATUM.—Entom. xiii. 112. Dr. Power's note referred to *Dromius nigriventris*, and not to *A. consputus*.

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CECIDOMYIA RANUNCULI?

By EDWARD A. FITCH.



GALL OF *CECIDOMYIA RANUNCULI*?

LAST August I found in one of my meadows, which had that year been mown for hay, several cecidomyioid galls on the lower leaves of *Ranunculus repens*. These were quite new to me, and were found in one corner of the field only, but there were somewhat abundant.

The only gall on *Ranunculus* which I can find described is that of Bremi's *Cecidomyia ranunculi*, and since his time this does not appear to have been again found. I am very doubtful whether my gall is really Bremi's species, and, unfortunately, have now only the dry gnats to examine: his description differs from my specimens in many particulars, but I should like to compare living examples, which only can be satisfactory, as these fragile little Dipterons change greatly after death.

The galls were only found on the lower leaves of the buttercup (*R. repens*). Of the three palmate segments into which these leaves are divided, the two outer ones were invariably rolled inwards from the base, and thus formed a thickened and hardened pseudo-gall at the base of the leaf (see figure); the middle segment of the leaf was rarely galled. The galled segments were in no way discoloured; Bremi's galls were reddish brown. There were several larvæ of the *Cecidomyia* in each roll; with me the numbers varied from two to ten; these were pale ochreous, or cream-colour; certainly not orange-yellow, as says Bremi. The metamorphosis took place within the gall, and I bred many imagos at the end of August.

Cecidomyia ranunculi is described in the 'Neue Denkschriften der allg. Schweiz. Gesellschaft,' vol. ix., p. 29 (1847). The galls from which the imagos were bred occurred on *Ranunculus bulbosus*, near Zurich, in July; but Bremi also found somewhat similar galls, at the same time and place, on the leaves of *Trifolium pratense*; he did not breed the gall-makers, but describes the gall as a variety of *Cecidomyia ranunculi*.

Maldon, Essex, December, 1879.

BRITISH GALL-GNATS.

By EDWARD A. FITCH.

HAVING recently called attention to one Dipterous family, in which gall-makers are common, and said a few words on our little knowledge of the British species (Entom. xii. 257), I am led to think that a few remarks on our gall-gnats may be acceptable and instructive.

In speaking of the *Trypetidæ*, I have already stated that while the imagos are amongst the most beautifully marked and brightly coloured of the Diptera, the galls which they inhabit are especially liable to be overlooked. With the *Cecidomyidæ* the converse of this holds generally, for many of the plant deformities they occasion are amongst the best known of all galls, while the gall-gnats themselves are very small and obscure; though when examined alive, and under a lens, the often bright red colour and beautiful antennæ, especially of the males, make them objects of great beauty and interest. Their preservation for a collection is,

however, difficult, and the specific characteristics very superficial. It is this which makes a knowledge of their economy so important, and in the case of many species it is most interesting.

The *Cecidomyiidae* have had a double band of students; the abnormal vegetal productions, which many of them occasion, have attracted the attention of many botanists, as well as entomologists; while but few have turned their attention to the insignificant gall-makers themselves.

Both must go hand in hand. J. J. Bremi, of Zurich, was the great pioneer in this direction (1847), and he was soon followed by H. Loew (1850) and Winnertz (1853). Bremi's valuable memoir, published in volume nine of the 'Neue Denkschriften der allg. Schweizerischen Gesellschaft,' is illustrated with two excellent coloured plates, containing admirable figures of twenty-seven distinct galls, together with various details of certain imagos. H. Loew's *Dipterologische Beiträge*, No. 4, was published in the 'Programm des Königl. Friedrich-Wilhelm-Gymnasiums zu Posen,' and was followed in the succeeding year by a paper, 'Zur Kenntniss der Gallmücken,' in *Linnæa Entomologica* (vol. v., pp. 370—384). Winnertz' important "Monographie der Gallmücken" was also published in *Linnæa Entomologica* (vol. viii., pp. 154—324); this is illustrated with four plain plates, mostly containing details, especially antennæ, palpi, wings and ovipositors, of the imagos. Several of these gnats and their galls came under the notice of the older authors, notably Réaumur, Frisch, Swammerdam, DeGeer, and Schrank, but it is with Meigen that the real history of all Diptera commences. The first volume of his wonderful work was published in 1818. This contained the *Cecidomyiidae*; in the whole work Meigen has described fifty-two species, but the identity of several is quite uncertain.

Further reference to gall-gnat literature cannot be made here. I only need say that Dr. Franz Löw is now studying the *Cecidomyiidae* and their productions, and his papers have lately been published in the 'Verhandlungen z.-b. Gesellschaft in Wien.' Volume twenty-six of this publication contains the "Synopsis Cecidomyidarum," by J. E. v. Bergenstamm and Paul Löw, of which I have made great use in preparing the accompanying table of our British species.

Rondani's division of the family *Cecidomyiidae* into the two

sub-families *Lestremiinae* and *Cecidomyiinae* is there adopted. The forty-eight species distributed amongst six genera of *Lestremiinae* do not include a gall-maker, most of the larvæ feeding in rotten wood; these are related to the *Mycetophilidæ*. The sub-family *Cecidomyiinae* includes 458 good species, to which may be added five which are described but not named, and 143 whose economy is recorded, but the imago is not sufficiently described. This makes a total of 606 species, which are included in seventeen genera. Sixteen new species have since been characterised. The economy of these numerous *Cecidomyiinae* is very varied; many feed in rotten wood, some in decaying plants and bulbs, some under the bark of trees, a few in fungi, others in living plants, either in fruit organs or on leaves without any hypertrophy, but the majority are true gall-gnats causing galls on variable parts of nearly all orders of plants; a few, however, are inquiline in galls formed by other species, both dipterous and hymenopterous, while the larva of *Diplosis aphidimyza*, as I have already remarked in these pages, feeds on various Aphides. It is thus seen there are several exceptions to the gall-making peculiarity. Owing mostly perhaps to the far too general distribution of that great corn pest, *Cecidomyia tritici*, the small apod, mostly yellow or orange, larvæ of the *Cecidomyidæ* are well known. In the gall-making species some pupate in the gall, while others quit it when full-fed larvæ, and change in the earth or amongst rubbish; one or two species spin a cocoon. In my synopsis of species I have instanced the character of their metamorphoses in all cases, as it is important when breeding the gnats. Most of the larvæ are exceedingly lethargic in their movements, but a few, especially those of *Diplosis loti*, have an extraordinary saltant power. Nicholas Wagner's three remarkable memoirs on the viviparous larvæ of certain species which live under the bark of trees only need mention to be referred to. The gall-gnat larvæ are preyed upon by various Hymenopterous parasites belonging to the families *Ceraphronidæ*, *Platygasteridæ*, *Mymaridæ*, *Eurytomidæ*, *Torymidæ*, *Pteromalidæ*, *Hormoceridæ*, *Encyrtidæ*, and *Tetrastichidæ*. To refer to all the points of interest in the economy of the *Cecidomyidæ*, and to keep this article within reasonable limits, is impossible. I will therefore proceed with a review of our British species, giving the first English references to occurrence, and stating where the galls are

figured; the arrangement is alphabetical, as this appears the most convenient. In this country first Mr. Hardy, then Mr. Inchbald, and later Mr. Müller published from time to time some most interesting notes on the productions and habits of these gall-making Diptera, and during the last few years Dr. Trail has added much to our knowledge of the galls by his papers in the 'Scottish Naturalist,' which have lately been collected and revised in the 'Transactions of the Natural History Society of Aberdeen.' Still much is to be done; additions to the following list should not be difficult. The three volume systematic work of Walker and Haliday on our British Diptera is well known. There (vol. iii., p. 73), we read, "These flies (Cecidomyzidæ) are the most elegant and delicate little creatures in the whole of the Diptera."

ACROPHILA, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 82. W. Cole, Proc. Ent. Soc. Lond. 1874, p. xix.

Pod-like leaflets of *Fraxinus excelsior*. Metamorphosis external.

BETULÆ, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 85. Figured, Fr. Löw, Verh. z.-b. Gesell. Wien. xxviii., pl. iv. fig. 4.

Enlarged fruit of *Betula alba*. Metamorphosis internal.

BOTULARIA, *Wtz.* (DIPLOSIS). Hardy, Scot. Gard. iii. 139. Walker, I. B. iii. 111. Müller, Entom. v. 248. Figured, Bremi, pl. i., fig. 17.

Swollen midrib of leaflets of *Fraxinus excelsior*. Metamorphosis external.

BRASSICÆ, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 84.

Deformed flowers and pods of *Brassica oleracea*, &c. Metamorphosis external.

BURSARIA, *Br.* (CECIDOMYIA). Walker, I. B. iii. 89. Müller, Entom. vi. 180. Figured, Bremi, pl. i. fig. 20.

Tubular galls on leaves of *Glechoma hederacea*. Metamorphosis internal.

BUXI, *Lab.* (DIPLOSIS). Fitch, Essex and Suffolk. ? Armistead, Zool., 2nd ser., p. 1201. Figured, Laboulbène, Ann. Soc. Ent. Fr., 5th ser., vol. iii. pl. 9.

Swollen leaves of *Buxus sempervirens*. Metamorphosis internal.

CALLIDA, *Wtz.* (DIPLOSIS). Walker, I. B. iii. 95.

Thickened seed capsule of *Papaver Rhæas* and *P. dubium*. Metamorphosis internal.

CAMPANULÆ, *Müller* (undescribed). Proc. Ent. Soc. Lond. 1871, p. 8 (see Entom. v. 295). Trail, Trans. N. H. S. Aberdeen, 1878, p. 66.

Axillary bud-galls and inflated seed-capsules of *Campanula rotundifolia*.

CAPREÆ, *Wtz.* (HORMOMYIA). Hardy, Scot. Gard. iii. 80. Walker, I. B. iii. 123. Figured, Bremi, pl. ii. fig. 38.

Very small conical hard galls on leaf of *Salix caprea* and *S. aurita*.
Metamorphosis external.

CARDAMINIS, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 83.

Deformed leafbuds and flowers of *Cardamine pratensis*. Metamorphosis external.

CERASTII, *Binnie* (CECIDOMYIA). Proc. N. H. S. Glasgow, iii. 181.

Trail, Trans. N. H. S. Aberdeen, 1878, p. 57.

Swollen, fleshy, terminal leaves of *Cerastium vulgatum* (var. *glomeratum* and var. *viscosum*). Metamorphosis internal.

CLAUSILIA, *Br.* (undescribed). Fitch, Maldon. Figured, Bremi, pl. ii. fig. 33.

Short marginal incrustations of leaf of *Salix alba*.

CORNI, *Gir.* (HORMOMYIA). Müller, Ent. Ann. 1872, p. 15.

Hard multilocular conical gall on leaf of *Cornus sanguinea*. Metamorphosis external.

CORRUGANS, *Fr.* Löw (CECIDOMYIA). Trail, Trans. N. H. S., Aberdeen, 1878, p. 62.

Folded and distorted leaves of *Heracleum Sphondylium* and *Cherophyllum aromaticum*. Metamorphosis external.

CRATÆGI, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 13.

Terminal leaf rosette of *Crataegus oxyacantha* and *C. coccinea*. Metamorphosis external or internal.

DRYOBIA, *Fr.* Löw (DIPLOSI). Trail, Trans. N. H. S., Aberdeen, 1878, p. 74. Müller, Ent. Mo. Mag. vii. 89. Figured, Fr. Löw, Verh. z.-b. Gesell. Wien. xxvii., pl. i., fig. 5.

Thickened and discoloured marginal folds of leaf of *Quercus Robur*. Metamorphosis external.

EUPHORBÆ, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 82. Müller, Zool., 2nd ser., p. 1204. Figured, Bremi, pl. ii., figs. 24 and 25.

Terminal leaf-tufts on twigs of *Euphorbia*. Metamorphosis internal.

FAGI, *Hart* (HORMOMYIA). Walker, I. B. iii. 121. Figured, Réaumur's Memoirs, pl. 38. Ratzeburg, Forstinsecten, iii., pl. v., fig. 14.

Smooth pyriform gall on upper side of leaf of *Fagus sylvatica*. Metamorphosis internal.

FASCIATA, *Meig.* (HORMOMYIA). Walker, I. B. iii. 119.

Deformed flower-buds of *Epilobium angustifolium*.

FISCHERI, *Ffd.* (HORMOMYIA). Müller, Proc. Ent. Soc. London. 1871, p. x. (see Entom. v. 298).

Multilocular swellings at the leaf-bases of *Carex pilosa*. Metamorphosis internal.

GALEODOLONTIS, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 85. Inghald, Ent. W. Int. x. 69. Figured, Bremi, pl. ii., fig. 26.

Hairy pouch like gall of the young shoot of *Galeodolon luteum*. Metamorphosis internal.

GALII, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 86. Trail, Scot. Nat. i. 156, Trans. N. H. S., Aberdeen, 1878, p. 62.

Stems and flower-stalks of *Galium Mollugo* and *G. verum*. Metamorphosis external.

GENISTÆ, *H. Lw.* (ASPHONDYLIA). Müller, Ent. Ann., 1872, p. 15.

Buds of *Genista germanica*. Metamorphosis internal.

- GIRAUDI, *Ftld.* (CECIDOMYIA). Trail, Scot. Nat. ii. 78; Trans. N. H. S., Aberdeen, 1878, p. 59.
 Folded fleshy leaflet of *Astragalus hypoglottis*. Metamorphosis external.
- HELIANTHEMI, *Hardy* (DIPLOSI). Ann. Mag. Nat. Hist., 2nd ser., vi. 187 (1850). Trail, Trans. N. H. S., Aberdeen, 1878, p. 56.
 Terminal leaf-tuft of *Helianthemum vulgare*. Metamorphosis internal.
- HERACLEI, *Kltb.* (undescribed). Trail, Scot. Nat. iv. 15; Trans. N. H. S., Aberdeen, 1878, p. 62.
 Folded segments of leaf of *Heracleum Sphondylium*. Metamorphosis external.
- HETEROBIA, *H. Lw.* (CECIDOMYIA). Hardy, Ann. Mag. Nat. Hist. vi. 185. Walker, I. B. iii. 81. Figured, Bremi, pl. ii., fig. 23.
 Terminal artichoke gall of *Salix amygdalina*, *S. purpurea*, &c. Metamorphosis internal.
- HYPERICI, *Br.* (CECIDOMYIA). Haliday, Ent. Mag. iv. 148. Figured, Bremi, pl. ii., fig. 29.
 Terminal leaf-capsule of *Hypericum humifusum* and *H. perforatum*. Metamorphosis internal.
- INVOCATA, *Wtz.* (DIPLOSI). Walker, I. B. iii. 106.
 With *C. acrophila* in leaflets of *Fraxinus excelsior*. Metamorphosis external.
- JACOBÆE, *H. Lw.* (DIPLOSI). Trail, Trans. N. H. S., Aberdeen, 1878, p. 65.
 Swollen fleshy green flower-heads of *Senecio Jacobæe* and *S. aquaticus*.
- JUNIPERINA, *Lin.* (HORMOMYIA). Müller, Ent. Ann., 1872, p. 15.
 Figured, DeGeer, Memoires, vol. vi., pl. 25, figs. 7-10.
 Terminal cone-like galls on twigs of *Juniperus communis*. Metamorphosis internal.
- LATHYRI, *Ftld.* (undescribed). Trail, Scot. Nat. ii. 78; Trans. N. H. S., Aberdeen, 1878, p. 60.
 Fleshy leaflets of *Lathyrus pratensis* and *L. sylvestris*. Metamorphosis internal and external.
- LINARIÆ, *Wtz.* (DIPLOSI). Walker, I. B. iii. 97.
 Terminal leaf-tuft of *Linaria vulgaris*. Metamorphosis internal.
- LOTI, *Detf.* (DIPLOSI). Walker, I. B. iii. 97. Curtis, Farm. Ins., p. 491. Figured, DeGeer, Memoires, vi., pl. 27, fig. 1. Bremi, pl. i., fig. 21.
 Blooms and pods of *Lotus corniculatus*, *Medicago falcata*, *Vicia cracca*, &c. Metamorphosis external.
- MARGINEMTORQUENS, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 79. Müller, Ent. Mo. Mag. vi. 109. Figured, Bremi, pl. ii., fig. 32.
 Marginal rolls of leaf of *Salix viminalis*. Metamorphosis internal.
- MEDICAGINIS, *Br.* (undescribed). Trail, Trans. N. H. S., Aberdeen, 1878, p. 59. Figured, Bremi, pl. 1, fig. 16.
 Fleshy leaf of *Medicago sativa*, *Lotus corniculatus*, &c. Metamorphosis external.
- MILLEFOLII, *H. Lw.* (HORMOMYIA). Inebald, Ent. W. Int. viii. 195. Müller, Ent. Mo. Mag. vii. 39. Figured, Fr. Löw, Verh. z.-b. Gesell. xxiv. pl. ii., fig. 3.

- Leaf-axils of *Achillea millefolium*. Metamorphosis internal.
- ONOBRYCHIDIS, *Br.* (CECIDOMYIA). Trail, Soc. Nat. ii. 78. Figured, Bremi, pl. ii., fig. 30.
- Fleshy folded leaflets of *Onobrychis sativa*, *Medicago*, &c. Metamorphosis external.
- PAPAVERIS, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 78. Figured, Laboulbène. Ann. Soc. Ent. Fr., 3rd ser., vol. v., pl. xii., 1.
- Thickened seed-capsule of *Papaver Rhæas* and *P. dubium*. Metamorphosis internal.
- PAYIDA, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 90.
- With *C. acrophila* in leaflets of *Fraxinus excelsior*. Metamorphosis external.
- PERSICARIE, *Lin.* (CECIDOMYIA). Walker, I. B. iii. 79. Müller, Zool., 1869, p. 1705.
- Rolled and thickened leaf of *Polygonum amphibium* and *P. Persicaria*. Metamorphosis internal.
- PILIGERA, *H. Lw.* (HORMOMYIA). Walker, I. B. iii. 121. Müller, Zool., 2nd ser., p. 1201; Ent. Mo. Mag. v. 132; Figured, Ratzeburg Forstinsecten, iii., pl. v., fig. 13.
- Hairy conical gall on leaf of *Fagus sylvatica*. Metamorphosis internal.
- PILOSELLE, *Binnie* (CECIDOMYIA). Proc. N. H. S., Glasgow, iii. 179.
- Rolled leaf-margins of *Hieracium pilosella*. Metamorphosis external.
- PIMPINELLE, *F. Löw.* (ASPHONDYLIA). Curtis, Farm Insects, p. 416.
- Trail, Scot. Nat. i. 125. Figured, Bremi, pl. i., fig. 22, and F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 2.
- Inflated seeds of *Pimpinella saxifraga*, &c. Metamorphosis external.
- PLICATRIX, *H. Lw.* (CECIDOMYIA). Trail, Trans. N. H. S., Aberdeen, 1878, p. 60.
- Thickened and folded leaf of *Rubus fruticosus* and *R. cæsius*. Metamorphosis external.
- POÆ, *Bosc.* (HORMOMYIA). Walker, I. B. iii. 123 (*graminicola*).
- Ears of *Poa nemoralis*. Metamorphosis internal.
- PRUNI, *Kalt.* (undescribed). Moncreaff, Entom. v. 240. Fitch, Entom. x. 30. Figured, Verh. z.-b. Gesell. Wien. xxv., pl. ii., fig. 3.
- Pouches on ribs of leaf of *Prunus spinosa*. Metamorphosis external.
- PTARMICE, *Vallot.* (HORMOMYIA). Walker, I. B. iii. 122. Inehbald, Ent. W. Int. viii. 164.
- Flower-head of *Achillea Ptarmica*. Metamorphosis internal.
- PTERIDIS, *Müller* (undescribed). Ent. Mo. Mag. viii. 99. Trail, Scot. Nat. ii. 304; Trans. N. H. S., Aberdeen, 1878, p. 77.
- Thickened and discoloured pinnæ of *Pteris aquilina*.
- PYRI, *Bouché* (CECIDOMYIA). Walker, I. B. iii. 89. Müller, Gard. Chr., 1870, p. 1054.
- Marginal leaf-rolls of *Fyrus communis*. Metamorphosis external.
- QUERCUS, *Binnie* (CECIDOMYIA). Proc. N. H. S., Glasgow, iii. 179-81.
- Twisted terminal shoots of oak. Metamorphosis external.
- RANUNCULI, *Br.* (CECIDOMYIA). Fitch, Entom. xiii. 145. ? Figured, Bremi, pl. ii., fig. 34.
- Leaves of *Ranunculus repens*. Metamorphosis internal.

? RHODODENDRI, *Fallot* (undescribed). Trail, Scot. Nat. ii. 251.

Terminal bud-like leaf-rosettes of *Rhododendron ferrugineum*.

ROSARIA, *H. Lw.* (CECIDOMYIA). Hardy, Ann. Mag. N. H. vi. 185.

Walker, I. B. iii. 77. Smith, Entom. ii. 234. Figured, Frisch, Besch., part xii., pl. ii., fig. 1; Swammerdam, pl. 44, fig. 16; and DeGeer, Memoires, vol. vi., pl. 26, figs. 1-4.

Terminal leaf-rosettes of *Salix*. Metamorphosis internal.

ROSARUM, *Hardy* (CECIDOMYIA). Ann. Mag. N. H. vi. 186. Figured, Bremi, pl. ii., fig. 31.

Folded thickened leaflet of *Rosa*. Metamorphosis external.

RUBI, *Heeger* (LASIOPTERA). Walker, I. B. iii. 133. Figured, Réaumur, Memoires, pl. 36, figs. 1-5.

Stems of *Rubus*. Metamorphosis internal.

RUMICIS, *H. Lw.* (DIPLOSI). Walker, I. B. iii. 100.

Deformed blooms of *Rumex*.

SALICETI, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 90.

In terminal leaves of *Salix fragilis* with *C. terminalis*. Metamorphosis external.

SALICINA, *Schrk.* (CECIDOMYIA). Walker, I. B. iii. 80. Müller, Ent. Mo. Mag. vi. 109. Figured, Frisch, Besch., part iv., pl. xxi., figs. 1-4; Giraud, Verh. z.-b. Gesell. Wien. xi., pl. xvii., fig. 3.

Terminal leaflets of *Salix alba*, &c. Metamorphosis internal.

SALICIPERDA, *Dufour* (CECIDOMYIA). Walker, I. B. iii. 78. Figured, Westwood, Gard. Chron., 1847, p. 588 (*C. riminalis*).

In twigs of *Salix* and *Populus*. Metamorphosis internal.

SALICIS, *Schrk.* (CECIDOMYIA). Hardy, Ann. Mag. N. H. vi. 185. Walker, I. B. iii. 77. Inchbald, Ent. W. Int. x. 61. Figured, DeGeer, Memoires, vol. vi., pl. 26, fig. 7.

Multilocular swellings of twigs of *Salix caprea*, &c. Metamorphosis internal.

SAROTHAMNI, *H. Lw.* (ASPHONDYLIA). Walker, I. B. iii. 117. Müller, Ent. Ann., 1872, p. 15. Trail, Scot. Nat. ii. 32.

Bud-shaped galls on twigs of *Sarothamnus scoparius*. Metamorphosis internal.

SEROTINA, *Wtz.* (CECIDOMYIA). Walker, I. B. iii. 84. Trail, Scot. Nat. ii. 31.

Top shoots of *Hypericum humifusum*. Metamorphosis external.

SISYMBRII, *Schrk.* (CECIDOMYIA). Walker, I. B. iii. 80. Figured, Curtis, Gard. Chron., 1845, p. 400.

Deformed flowers of *Barbarea vulgaris*, *Nasturtium*, *Sisymbrium*, &c. Metamorphosis internal.

TAXI, *Inchbald* (CECIDOMYIA). Ent. W. Int. x. 76; Naturalist, 1864, p. 79. Müller, Ent. Mo. Mag. vi. 61.

Terminal leaf-rosette of *Taxus baccata*. Metamorphosis internal.

TERMINALIS, *H. Lw.* (CECIDOMYIA). Walker, I. B. iii. 81. Müller, Ent. Mo. Mag. vii. 89. Figured, Réaumur, Mem., pl. 18, figs. 9-12; Swammerdam, pl. 44, fig. 14; F. Löw, Verh. z.-b. Gesell. Wien. xxv., pl. ii., fig. 2.

Terminal leaves of *Salix fragilis* and *S. alba*. Metamorphosis internal and external.

TILLE, *Schrk.* (undescribed). Trail, Scot. Nat. v. 214. Figured, Réaumur, Mem., iii., pl. 34, fig. 7.

- Thickened marginal rolls of leaf of *Tilia Europæa*. Metamorphosis external.
- TORNATELLA, *Bremi* (undescribed). Trail, Trans. N. H. S., Aberdeen, 1878, p. 75. Figured, *Bremi*, pl. i., fig. 13.
- Small rifle-bullet-like galls on upper side of leaf of *Fagus sylvatica*. Metamorphosis internal.
- TREMULÆ, *Wt.* (DIPLOSIS). Walker, I. B. iii. 114. Figured, *Bremi*, pl. i., fig. 14; F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 10.
- Leaf and leaf-stalk of *Populus tremula*. Metamorphosis external.
- TRIFOLI, *F. Löw* (CECIDOMYIA). Trail, Scot. Nat. i. 195. Figured, F. Löw, Verh. z.-b. Gesell. Wien. xxiv., pl. ii., fig. 4.
- Folded leaflet of *Trifolium pratense* and *T. repens*. Metamorphosis internal.
- ULICIS, *Trail* (ASPHONDYLIA). Scot. Nat. ii. 172; and Trans. N. H. S., Aberdeen, 1878, p. 58. Verrall, Ent. Mo. Mag. xi. 224.
- Inflated flower-bud of *Ulex Europæus*. Metamorphosis internal.
- ULMARIE, *Br.* (CECIDOMYIA). Walker, I. B. iii. 88. Kidd., Ent. Mo. Mag. iv. 233. Figured, *Bremi*, pl. i., fig. 15. Ormerod, Entom. xi. 12.
- Leaf of *Spiræa ulmaria*. Metamorphosis internal.
- UMBELLATARUM, *F. Löw* (ASPHONDYLIA). Verh. z.-b. Gesell. Wien. xxvii. 31. See *A. pimpinellæ*.
- URTICÆ, *Perris* (CECIDOMYIA). Walker, I. B. iii. 89. Müller, Ent. Mo. Mag. vi. 137. Figured, Swammerdam, pl. 45, figs. 2-5; and Perris, Ann. Soc. Ent. Fr., vol. ix. (1840), pl. xi., 1.
- Leaf and stem of *Urtica dioica*. Metamorphosis external.
- VERONICÆ, *Vallot* (CECIDOMYIA). Haliday, Ent. Mag. iv. 147. Inchebald, Ent. W. Int. viii. 196. Figured, *Bremi*, pl. ii., fig. 28.
- End of leaf of *Veronica Chamædrys*. Metamorphosis internal.

HYBRIDS AND DEGENERACY.

BY ALFRED WAILLY.

(Membre-Lauréat de la Société d'Acclimatation de Paris.)

HAVING received several communications on the subject of hybrid species, the last being from Herr L. Huesmann, I will state the little I know, and the few facts which have come under my notice.

As is well known, hybrids have been obtained by the crossing of *Smerinthus ocellatus* with *S. populi*; also by the crossing of the different species of *Saturnia*: *pyri*, *spini*, and *carpini*; *Pavonia-major*, *Pavonia-media*, *Pavonia-minor*. Hybrids have also been obtained by the crossing of the oak-silkworms, *Attacus Yama-Mai* and *A. Pernyi*. These hybrids are certainly very interesting

to the entomologist, but what I wish to consider is whether they have any power of reproduction, at least in a state of captivity.

In the South of France we have a very local species of *Papilio*; *P. Alexanor*, which, although of the same shape and colour as *P. Machaon*, has its upper wings very similar to those of *P. Podalirius*. Might not *Alexanor*, although a distinct and well-established species, have been originally the product of a natural crossing of *Machaon* with *Podalirius*? If crossings take place in a state of captivity, they may also take place in a state of liberty, and produce those species which we find so closely allied.

Yet what I am going to say respecting the hybrids of *A. Yama-Mai* and *A. Pernyi* would go against this possibility of new species being permanently obtained by natural crossings, but it is well known that in a state of confinement, Lepidoptera bred from the same small stock, degenerate to such an extent that about the third season the ova obtained become infertile, or the young larvæ too weak to live. It has been the case with several species I have bred, and I should like to hear that this was only accidental, and that the same species could be bred in confinement on a small scale for a long succession of years without showing any signs of degeneracy. With hybrids, degeneracy in a state of captivity would of course be much greater than with natural and well-established species.

From the fact that Lepidoptera, bred from the same small stock in a state of confinement, degenerate and usually become extinct in the third year, it must not be concluded that consanguinity is the cause of it. Want of space, of pure air, and proper food, may probably be the causes. In support of this I may mention that M. V. La Perre de Roo has contributed to the 'Bulletin de la Société d'Acclimatation,' several papers of the highest interest and importance on "The pretended fatal effects of consanguineous alliances," in which the author, after twenty years' experience with various species of animals, says that consanguinity is not a cause of degeneracy; that whenever the latter takes place it is due to other causes which have not been discovered.

M. La Perre de Roo maintains that degeneracy through consanguinity in the human race, as well as in all other animals,

is a popular error, entirely unsupported by facts, and that the foolish prejudice which attributes all sorts of accidents to consanguinity is unworthy of being taken into consideration by science, but, as he quotes from Lebrun:—

“On ne détruit pas aisément
Le préjugé ni l'habitude.”

The reports of M. La Perre de Roo have not yet been all published: the first appeared July, 1878; the second, January, 1879; the third, September, 1879. The last of these contains an account of his experiments on the breeding of many species of birds during a long series of years, in most cases beginning only with one couple of the same species. The generations obtained never showed any signs of degeneracy; on the contrary, several races were improved by his skilful breeding.

Hybrids of *A. Yama-Mai* and *A. Pernyi*, so far as I know, have been complete failures respecting the reproduction of the species. A few years ago, M. Bigot, one of the best French sericulturists, obtained hybrids by crossing the female of *A. Yama-Mai* with the male of *A. Pernyi*, and *vice versa*, but these races are now extinct. Yet the larvæ and moths were fine and large. The late Mr. Andrew Murray showed me, in 1876, magnificent specimens of these hybrids which he had obtained from M. Bigot. These hybrids, like those obtained by other entomologists, hybernated in the pupa state. Had the hybrid come into existence in a state of nature, and in warm countries where the parent insects could live entirely in a wild state, would the said hybrids have had the power of reproduction, and would they have continued to live as distinct species? This of course it is, as yet, impossible to answer.

M. E. Berce, author of the ‘Faune entomologique Française’ and other works, and who is a most experienced French entomologist, also had hybrid *Yama-Mai-Pernyi*, which, I was told, had been in existence for a few years. M. Berce gave me in Paris (I believe during the winter of 1875) some nineteen cocoons of this hybrid species; they were so thin that they could hardly be called cocoons. Evidently the insect was in the last stage of its existence, for I only obtained one female moth, which paired with a male *Pernyi*. The larvæ, when hatched, were entirely black, like *Pernyi*, and had no resemblance to *Yama-Mai*.

They had returned to the type *Pernyi*, which is the stronger of the two. The other cocoons contained dead larvæ or dead pupæ.

At a meeting held at the Society of Arts on the 25th of April, 1879, during the discussion which followed the interesting lecture delivered by Mr. Thomas Wardle, on the wild silks of India, I heard something about another hybrid which had been obtained in Bombay. The statement made by Mr. A. Rogers was as follows:—"A curious fact came under my notice. There was a man in Bombay, a barber, who made a most remarkable discovery with regard to Tusser silk. He showed me the produce of silk which had been spun by a hybrid worm, produced between the common Indian Tusser worm and what he said was the Japanese *Yama-Mai*. Whether that was the case I cannot say, but he certainly showed me two worms which were about the size of my little finger, and he informed me that the silk produced was much freer from tannin than the indigenous Tusser found in the jungle. He showed me some specimens, and, so far as I could judge, the hybrid silk was far superior to the other. Mr. Morris assured me that this hybrid would feed on the commonest trees in the country."

Mr. Wardle, in commenting upon the above statement, said, he doubted whether Mr. Rogers was correct, because the *Yama-Mai* was a Japanese species which was an oak-feeder, whereas the Tusser worm fed on very dissimilar food. Mr. Wardle said the Tusser cocoons contained no tannin or woody matter.

With regard to Mr. Wardle's assertion, I must say that the Tusser worm, like most other wild silk-producers, is essentially polyphagous, and that last year it was reared on oak by several entomologists, and on hornbeam by Mr. P. H. Gosse.

Another hybrid between *Yama-Mai* and *Pernyi* was also mentioned in 1878, but, as for some reasons it has not yet come into the public domain, I can only quote from the discoverer of this wonderful hybrid, who is M. Bourdier, of Montboyer, France. After speaking of the merits of *Yama-Mai*, and the advantages enjoyed by *Pernyi* over *Yama-Mai*, he thus speaks of his *Perny-Yama*:—"This fruitful hybrid has over its parents the immense advantage of being perfectly hardy; it will resist a temperature of 0° centigrade (freezing-point), and will eat even dried-up leaves if they are not brittle. There is a second brood each year if the breeder, by artificial means, hastens the emergence of the

moths from the hibernating cocoons. Eggs scattered in the country will for ever people our oak-forests with this silk-producer, which can hardly degenerate. A mere 'delocalisation' of a few miles, which the moths will cross over with a single stroke of their powerful wings, will be sufficient for their regeneracy."

Such is the short sketch (which I have translated freely from the original French) of this hybrid which has been denominated by Monsieur Bourdier, "*Perny-Yama de Montboyer*."

I may mention that for several years I have obtained pairings of different species:—*Pernyi* (male) with *Polyphemus* (female); *Cecropia* (male) with *Cynthia* (female), several times; *Cecropia* (male), with *Gloveri* (female); *Cecropia* (male) with *Polyphemus* (female), several times; but in all such cases the eggs were infertile. Crossings of *Attacus Pyri* with *Cecropia* have proved equally fruitless.

110, Clapham Road, S.W., June, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 133.)

Olindia ulmana, Hub.—A local and uncommon species. The imago appears towards the end of June and in July among elm, hazel, and alder, and flies freely in the afternoon sunshine. A few years ago I met with this insect commonly among some alders, but it is very difficult to see on the wing; and I found the best plan was to lie down, when they were easily discernible against the sky. The localities are Tilgate Forest, Haslemere, and Hastings; Box Hill, Esher; and Folkestone.

Semasia spiniana, F. v. R.—Local, but much more plentiful some seasons than others. The imago appears in July and August, and flies in the afternoon sunshine. It should be looked for among blackthorn hedges; and has occurred at Darenth and Birch Woods; Croydon, West Wickham, Mickleham, Ashstead; and Tilgate Forest.

S. janthinana, Dup.—Distributed throughout among hawthorn hedges. The imago appears in July and August, and flies in the morning and afternoon sunshine. The larva is said to feed in the

ripe berries of the hawthorn late in the autumn, and to hybernate in a silken cocoon on the surface of the ground.

S. rufillana, Zell.—Not uncommon where its food-plant, the wild carrot (*Daucus carota*), occurs. The imago appears in July and August, and flies in the sunshine; it is more abundant near the coast. The larva feeds in the autumn in the seed-heads of the wild carrot; hybernates and pupates in the spring. The localities are Croydon, Mickleham, Box Hill, Sanderstead; Darenth, Gravesend, Deal, Dover, Canterbury, and Folkestone; Worthing, Eastbourne, Brighton, &c.

S. Wæberana, Schiff.—Abundant in all orchards and fruit gardens. The larva feeds on the inner bark of all kinds of fruit trees, and also common laurel. The imago appears continuously throughout the summer, and may be found at rest on the stems of the fruit trees; and also captured on the wing at dusk.

Coccyx strobilella, Linn.—Distributed among spruce firs. The larva feeds in the spruce fir cones, which should be gathered during the winter. The imago appears in May. This insect is more easily reared than captured.

C. splendidulana, Guen.—Common throughout among oaks. The imago appears in April and May, and flies in the afternoon sunshine; and is very partial to the flowers of the holly; it is also to be found on the trunks of the trees. The larva feeds on oak; and I have bred this species in plenty from galls when rearing *Ephippiphora obscurana*, but I am inclined to think the larva only entered the galls for pupation.

C. vernana, Knags.—Named by Dr. Knaggs (E. M. M. iv. 122), from three specimens taken by Mr. E. G. Meek, in Darenth Wood, towards the end of March, 1866. I am not aware of its subsequent occurrence, and am inclined to believe the examples above mentioned to be small specimens of *E. obscurana*, to which Dr. Knaggs' description applies equally well. Nothing is known of its earlier stages.

C. argyrana, Hub.—Abundant among oaks in April and May. The imago is to be found at rest on the trunks of the trees.

C. pygmæana, Hub.—The imago appears in April and May among fir trees, and is very scarce in this country. It has, I believe, occurred sparingly in Surrey.

C. hyrciniana, Uslar.—Not uncommon among spruce firs. The imago flies freely at dusk in May and June. Mr. C. G.

Barratt has found the larva laying the leaves of the spruce parallel with the shoot, and feeding in a small web. It has occurred at Sevenoaks, Tunbridge Wells, and near Dover; Tilgate Forest, Uckfield; Croydon, West Wickham; &c.

C. nanana, Treit.—Wilkinson writes: "The imago appears in June in abundance among spruce firs, and occurs wherever those trees grow, in the South of England." I have never been fortunate enough to meet with this insect, except single specimens, and therefore do not agree in its being at all a common species. It has been taken at Croydon, Sevenoaks, and Tilgate Forest.

Heusimene fimbriana, Steph.—The imago is not uncommon among oaks in March, April, and the early part of May. It is to be obtained by beating the branches into an umbrella or net, and drops very quickly when disturbed. The larva feeds on the oak, and pupates in galls, between dead leaves, in crevices in the bark, and similar situations.

Retinia buoliana, Schiff.—Common among various kinds of firs. The larva hatches in the autumn; and when the bud starts in the spring feeds actively upwards, eating out the entire centre of the shoot, and then descends into the old wood to pupate. The imago appears in June and July. It occurs throughout these counties.

R. pinicolana, Dbld.—Of similar habits to the preceding species, but much scarcer. The imago appears later, and is more sluggish in its movements. It is to be distinguished from *R. buoliana* by its straighter costa, longer and more pointed fore wings, and by the brighter colour and more silvery markings and appearance. It has occurred at Tunbridge Wells, Dartford; Hastings, Uckfield, Tilgate Forest; Croydon, West Wickham.

R. turionana, Hub.—The imago appears towards the end of April and in May among Scotch firs (*Pinus sylvestris*), and flies at dusk. The larva feeds in the central shoot, eating out the centre, and when full fed either retires into the old wood or wanders away to pupate. The larvæ should be looked for early in April, and are full fed when *R. pinivorana* larvæ are only about half-sized. It has occurred at Croydon, Weybridge, West Wickham, Shirley; Haslemere, Uckfield; Birch Wood, Tunbridge Wells, and Sevenoaks.

R. pinivorana, Zell.—Commoner than the former species.

The imago appears in May and June among Scotch firs. The larvæ feed in the shoots, but seem to prefer the side shoots rather than the central one, and should be collected about the end of April. Besides the localities named for the preceding species it has occurred at Lewisham, and near Dover.

R. sylvestrana, Curt.—Rather local. The larva feeds in the shoots of the stone pine (*Pinus pinea*) and other pines in March and April, and its presence can be detected by the pellet of frass ejected by the larva from its tunnel, and which remains affixed to the infected shoot. The imago appears in June and July, and has occurred at Croydon and West Wickham, and I have met with a single specimen in this neighbourhood.

Carpocapsa splendana, Hub.—Not uncommon in oak woods in July and August, when the imago flies freely at dusk; and is also to be obtained by beating. The specimens vary considerably in size. The larva feeds in acorns in the autumn, but I have never succeeded in rearing the insect. It occurs generally throughout these counties.

C. grossana, Haw.—The imago should be looked for among beeches in June and July, flying round the trees at dusk; but it is not common. The larva feeds in the beech mast on the seeds, and is not easy to rear.

C. pomonella, Linn.—Common in all apple orchards. The life-history is as follows:—The egg is laid in the calyx of the apple, and hatches shortly after the young apple is ^{made} ~~found~~; the larva eating its way to the core, devours the pips, and makes its egress on the opposite side to which it entered. If two apples are on a bunch the larva passes from one to the other. It occasionally attacks nuts in a similar way. The imago is to be met with freely at dusk in June and July, flying round the trees.

Opadia Funebrana, Treit.—The imago of this insect is very rare, while the larva is not at all uncommon in some seasons in gardens and orchards, feeding inside plums and damsons. The imago appears in June. The larva is full fed in the autumn, when it retires to pupate, but does not accomplish the change until the following spring. In confinement they should be supplied with bits of cork, chips of bark, &c., of which they will eagerly avail themselves.

Putney, June, 1880.

(To be continued.)

STIGMONOTA SCOPARIANA, H.-S.: A TORTRIX NEW TO
THE BRITISH FAUNA.

BY J. B. HODGKINSON.

DURING the last week in April and first week in May I bred six specimens of a splendid Tortrix new to me, which at first sight I thought were very large *Lithocolletis ulmifoliella*. They came out of my rearing pot, in which I was breeding *Nepticula sorbiella* from the mountain ash. At first I set them down in my own mind as from queer larvæ which I got last July from the *Sorbus*, which I collected, thinking they might produce *Epigraphia Steinkellneriella*. However, when I sent both sexes to Mr. C. G. Barrett he thought there must be a mistake, as the larvæ of the genus *Stigmonota* are not cone or fruit-eaters. I at once bethought me, more especially when *Scopariana* was mentioned by the name, that I had been beating broom at the same time I was beating the *Sorbus*. This broom was a few yards from my house, at Dutton, so most likely the larvæ got mixed up. I must try this season to find more, but the broom is a very scarce plant in that district. *S. scopariana* is quite as brilliant a species as *Choreutes scintilulana*, and is a grand addition to our fauna.

Preston, Lancashire, June, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

CHÆROCAMPA NERII AT CRIEFF.—In a small collection of British insects made by Mr. W. Grant, of Strathearn, Crieff, I find among other things, chiefly common, a very fair specimen of *C. nerii*. It was found in 1873 by Mr. Grant's gardener among some grass which he was cutting, probably about July. The owner of the specimen was aware that it was an oleander hawk, but was quite ignorant of its rarity. I have thought it worth while to send you this note as, apart from the scarcity of the species, I am informed by Dr. Buchanan White that it has never been recorded from Scotland before. — GILBERT H. RAYNOR; School-house, Crieff, Perthshire, June 14, 1880.

ACRONYCTA ALNI.—I took a fine specimen of *A. alni*, at rest on an oak tree in Repton Shrubs, on the 12th of June.—J. E. NOWERS; Burton-on-Trent.

ACRONYCTA ALNI.—On June 9th, whilst staying at Lyndhurst, I took a very fine specimen of this rare species, which I dislodged from a beech tree.—LEWIS F. HILL; 4, Craven Terrace, Ealing, June 11, 1880.

CAPTURES OF LEPIDOPTERA IN KENT.—During Whitsuntide I collected, in company with Mr. J. P. Barrett, of Peckham, in the neighbourhood of Higham, Kent. Though in the daytime the weather was fine and warm, there was a constant east wind, which made the nights very cold. Nothing whatever came to sugar, and very little indeed was on the wing. Of butterflies *Satyrus Aegeria* was plentiful in the rides, with an occasional *Anthocharis Cardamines*, *Syricthus alveolus* &c., with larvæ of *Arge Galathea* common, and *Thecla W-Album* scarce. Of moths *Corycia taminata* was common, and we got a nice series; and *Eurymene dolabraria*, *Ephyra omicronaria*, *Anticlea derivata*, *Notodonta camelina*, *Teniocampa gracilis*, *Herminia barbalis*, and others also occurred. Amongst larvæ we were more fortunate. *Nola albulalis* was not uncommon, but still very small; and the beautiful larva of *Toxocampa pastinum* we collected full fed, commonly from *Vicia*. Those of *Pterophorus rhododactylus* were very small, and although we found one bush with plenty on, they were generally scarce, probably from the absence on most bushes of any rosebuds. Other larvæ included *Euthemonia russula*, *Ourapteryx sambucata*, *Triphæna fimbria*, freely full grown; *Epunda viminalis* in profusion on the willows, with many other species.—GEO. T. PORRITT, Highroyd House, Huddersfield, May, 1880.

CAPTURES IN STAFFORDSHIRE.—On the 8th of this month (May) I was out insect-hunting and again captured *Epunda nigra*, a female. This makes the fourth year I have taken one in the early part of May, all females; I have not found one in the autumn. It was only just emerged from pupa, being full of a pinky juice. It was taken from a whitethorn, the same tree I took one from last year. I also captured two *Notodonta dodonæa*, the first I have taken in this district. *Noctua plecta* and *Euplexia lucipara* are plentiful and in fine condition, owing perhaps to the dry weather.—S. BRADBURY; Abbots Bromley, Staffordshire, May 24, 1880.

LITHOSIA RUBRICOLLIS IN WALES.—On May 20th, I found *L. rubricollis* at Llanrwst, in North Wales.—J. W. BENTLEY; Castleton, near Manchester, June, 1880.

NOTODONTA TREPIDA IN CORNWALL.—When down in Cornwall last September, I caught on an oak-tree the larva of *Notodonta trepida*. It was crawling down the tree, apparently about to bury itself. The moth emerged about the 10th of this month. The place we found it was about five miles from Liskeard. This is a new locality for this species, as far as I can find out.—WILLIAM H. KYNASTON; Montpellier Lodge, Cheltenham, May 25, 1880.

NOTODONTA CHAONIA.—I have the pleasure of recording the appearance of the above species here this season, having bred the imago from a pupa found last autumn at the foot of an oak.—ALFRED WOOD, Westmeston Place, Westmeston, Sussex.

ARGYRESTHIA ÆRARIELLA BRED. — From larvæ collected last August, at the Bushes, near Manchester, feeding in the berries of mountain-ash, I have just bred a series of *Argyresthia ærariella*. Plenty of *A. conjugella* are emerging, but no intermediate forms have yet appeared. *Ærariella* is certainly a species. The males and females copulate freely, but never yet have been observed to do so with *A. conjugella*. I am sorry to say that this insect is not likely to be abundant.—J. H. THRELFALL; Preston, June 2, 1880.

NEMOPHORA PILELLA.—I have turned up *Nemophora pilella* this season; I never possessed the species before. I took a fine series in a fir wood, among *Vaccinium*, on the moors above Stoneyhurst College. Some specimens I have seen doing duty in collections for *Pilella* are *Nemophora Schwarziella*. This species is totally distinct when fine specimens are seen, the hind wings being much darker than in *Schwarziella*, and the fore wings more reticulated, like *N. metaxella*, and more rounded. Let anyone who has taken the lazy *Schwarziella* take *Pilella*; he will soon find out how much more wind it takes to blow *Pilella* down into the net to box. I expect it is nearly always blowing on the high moors, so the insect has learned to be more vigorous and active, to maintain its position in nature; it also runs about in the box, like *Tinea pellionella*. There can be no doubt the larva will be a *Vaccinium* feeder. Mr. Stainton says Zeller used to take it at Glogau, in fir woods, among bilberry. Mr. Stainton also says he has seen but very few British specimens.—J. B. HODGKINSON; Preston, June, 1880.

MICRO-LEPIDOPTERA BRED THIS SEASON.—From larvæ collected in Epping Forest last autumn, in April I reared from oak *Lithocolletis cramerella* and *L. quercifoliella* in plenty, but very few *L. lanantella*. From hornbeam, *L. carpinicolella* came out freely, with a few *L. tenella*. From birch, *L. ulmifoliella* and *Ornix betulævorella*; but considering the quantity of larvæ collected the number of moths have been small. From a *Lithocolletis* larva, mining the leaves of a species of wild plum, I have reared about twenty moths, which appeared different from anything I possessed. These I sent to Mr. Stainton for identification, and I quote his reply:—"I regret that I cannot determine them at all to my satisfaction; they are not *L. spinicolella*; they come nearest to some I received from Frankfort, bred from apricot." *Elachista poella* was so common on Hackney Marsh that I collected in April about a hundred pupæ one evening; and *E. nigrella* = *Gregsonella* swarmed about a mile from Hoe Street Station, on the roadside leading to Chingford, the middle of May. —W. MACHIN; 22, Argyle Road, Carlton Square, E., June, 1880.

CAPTURES IN SHETLAND.—Mr. E. G. Meek, with his usual enterprise, has sent one of his assistants to collect Lepidoptera, &c., in the Shetland Isles, for the whole of this season. He reports, after two months' absence, that he has captured some very beautiful varieties of *Hepialus humuli*, and also varieties of *H. velleda*. There may possibly exist a boreal species of the genus *Hepialus* in Shetland. If such is the case we may find it, on his return, amongst the *H. velleda* he mentions. As usual in our northern islands the wind and wet are the chief enemies of the entomologist, for Mr. Meek's collector had not seen a single butterfly, and only two Geometers, viz. *Eupithecia venosata* and *Larentia salicata*. —JOHN T. CARRINGTON; Royal Aquarium, S.W., June, 1880.

STAUROPIUS FAGI.—This season seems to have been exceptionally favourable to the production of *Stauropius fagi*, in Epping Forest and elsewhere. Mr. T. Eedle has obtained ten in five mornings' work, by searching on the trunks of beeches. A considerable number of others have also been taken at Epping, including a very dark variety of the female, taken by T. Eedle, junior. Other specimens have been bred from larvæ taken last season. Examples have also been found at Leith Hill, West Wickham, &c. —JOHN T. CARRINGTON; Westminster, June, 1880.

A USE OF THE HOOK TO THE TIBLE OF THE FORE-LEGS OF *HYLOBIUS ABIETIS*.—A short time ago a number of the above-mentioned weevils were sent me relatively to much harm they were doing in one locality, in Scotland; and after they had been imprisoned for some days, having nothing more suitable at hand, I placed a few specimens of half-grown spruce-galls, with young soft leaves on them, in the box with the *Hylobius* for food. They set to work greedily, and speedily cleared what was eatable; but in the case of one weevil, a soft young leaf which it had severed was crushed firmly into the end of the jaw, the piece of leaf sticking out most inconveniently behind. The weevil rubbed the extremity of the rostrum to and fro over the back of another, but this did no good, and no efforts shook the half "needle" loose, till, whether by instinct or haphazard I do not know, it applied the hook of the tibia of the left leg repeatedly, and so successfully that very shortly the piece of leaf was loosened and fell. Possibly this use of the hook is well known, but it was new to me, and was such a pretty sight I venture to offer a few lines on the subject.—E. A. ORMEROD; Spring Grove, Isleworth, W., June 1, 1880.

PHYTOMYZA LATERALIS, Fall.: A BENEFICENT DIPTERON.—In the spring of 1875 I had ten acres of red clover which was smothered with groundsel. In April of that year I was somewhat surprised to see a very great deal of the groundsel dying away before it seeded. Upon examination, the cause of this was found to be a small dipterous maggot feeding in the pith of the lower part of the stems. I collected many of these affected plants, and bred, about the middle of May, a quantity of the little flies, which I then sent to the late Mr. Newman, but he could not get them named. They pupated in the stems. Mr. R. H. Meade, to whom I have just lately sent a specimen, tells me it is *Phytomyza lateralis* of Fallen. I wished for its determination, as the larvæ have again appeared in some abundance. Last winter groundsel came up very thickly in some early-sown wheat; this was hoed twice, but much of the weed still lived, and it is now dying away, owing to the attacks of these little stem-feeding larvæ. Groundsel (*Senecio vulgaris*) is a troublesome weed on our good heavy land when in high condition. It is difficult to correctly determine these little Muscids; with *P. lateralis* there appears to be confusion. Kaltenbach says it lives in the stems of nettle (*Urtica dioica*),

vervain (*Verbena officinalis*), and *Centaurea Jacea*; also in the seed-heads of *Chrysanthemum inodorum* (Pflanzenfeinde, pp. 339 and 387). Harris also bred it from the receptacle of the chrysanthemum, and Curtis from *Anthemis Cotula* (Brit. Ent., 393); while Bouché gives Meigen's *lateralis* as mining the leaves of hound's-tongue (*Cynoglossum officinale* and *C. furcatum*) (Stett. Ent. Zeit., viii., 143). I have found the hound's-tongue leaf-miner here, and Mr. Inchbald has bred the chamomile seed-head fly (Field, xlviii., 471; Oct 21st, 1876); but surely these are not identical with the beneficent groundsel-destroyer.—EDWARD A. FITCH; Maldon, Essex, April 27, 1880.

PEA ENEMIES.—With me the great pea-crop enemy of this year took a somewhat different form from last (cf. Entom. xii. 194). I had twenty acres of November-sown peas intended for early podding, and which until April looked perhaps the best crop in the neighbourhood. Throughout that month they have suffered severely from the attacks of *Tipula* larvæ. These destructive larvæ were so numerous that I frequently found four or five around the root of one pea. They completely bark the plant just at the surface, and rather below it, leaving only the woody fibre for its support. It is almost unnecessary to say how very much this attack weakens all, and completely kills many, of the plants. *Tipula* larvæ were also very abundant and destructive in the wheat this year, especially where it is after clover.—EDWARD A. FITCH; Maldon, Essex.

LARVÆ OF STRATIOMYS IN WINTER.—I do not remember ever to have seen it stated in what condition the aquatic Stratiomidæ pass the winter months. The following note on the subject may be of interest:—I have a box which, in the summer, I use as a receptacle for aquatic larvæ. I place in it, at the bottom, sand and stones and some water-weeds, and keep it filled with water. During the past winter this box was emptied and placed in a cellar, but the sand was not removed, and consequently became dry. On getting this box out, towards the end of March, I was surprised to find amongst the sand a larva of *Stratiomys*, which showed signs of vitality. On placing this larva in water I found it was alive, and it soon became sufficiently active to move the organs of its mouth with the peculiar motion characteristic of the insect when in search of food. It buried itself in the stones at the bottom, leaving only a small portion of its body exposed, and

a bubble of air was attached to the aperture at the extremity of its tail. Indeed the insect seemed not to have suffered from its sojourn in the sand, where it must have lain for some three months at least. I may mention that I have seen it stated, in a standard work, that the food of these larvæ is supposed to consist of animalculæ, but it appears to me that they are vegetable feeders, subsisting upon the Confervæ which abound in stagnant pools. Perhaps some of your correspondents will inform me on this point.—ABBOTT G. LAKER; 4, Endwell Road, Brockley Rise, Brockley, S.E., April 28, 1880.

A SUCCESSFUL MOTH-TRAP.—I have been using a contrivance this season which will really repay one for the trifling trouble and expense involved in its construction. It consists first of a gallon glass jar, heavily charged with cyanide of potassium. To the top of this is fitted a funnel, the spreading mouth of which opens at right angles to the axis of the poisoned jar. The lower end of the funnel is four or five inches below the mouth of the jar, and has an opening three inches in diameter, the funnel mouth being twelve or thirteen inches across. Opposite the mouth of the funnel, and on the opposite side of the jar, is soldered to the funnel a sheet of tin so bent as to thoroughly enclose a lamp. The lamp is supported by a piece of tin hinged to the outer edge of this projection. The lamp being placed in position, the tin support is made to rest upon the projecting part of the jar below its neck. Immediately in front of the light is placed a sheet of mica. The whole contrivance is placed within a tight wooden box, and a tin flap is also arranged above the lamp chimney as a precaution against an undesired conflagration. The moth, attracted by the light, flies into the mouth of the funnel, is stopped by the mica, and, after fluttering a very short time, is so far overcome by the fumes of the potassium as to fall within the poisoned jar, whence it cannot emerge. A projecting lip of an inch or so in height is soldered to the lower edge of the mouth of the funnel in such a way as to catch any insect that falls outside the mouth of the jar. It thus is most likely to return to the light. I have taken with this contrivance hundreds of Noctuidæ and Coleoptera, among the former many things—especially among the Tineidæ—entirely new to my cabinet.—G. S. WESTCOTT; in Annual Report of the Entomological Society of the Province of Ontario, 1879.

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ZOMASPILIS MARGINARIA.

No. 1.



No. 2.

ZOMASPILIS MARGINARIA.



No. 3.

THINKING you might like to figure some of the varieties of this very pretty and variable moth, I have selected three specimens of the light varieties. No. 1 was captured some years ago near Great Stanmore, Middlesex, by myself; No. 2, also near the same place in a swampy hollow, formerly a reservoir of water for the supply of the grounds of Cannon's Park, Little Stanmore; No. 3 was captured near Maidstone, Kent, in 1878.

FREDERICK BOND.

Staines, Middlesex, July, 1880.

LOCALITIES FOR BEGINNERS.

BY JOHN T. CARRINGTON, F.L.S.

No. VIII.—WICKEN.

FOR the entomologist who is not afraid of work, and who is no mere dilettante, "The Fens" probably afford the richest of all localities for Lepidoptera in this country. Amongst fen-lands, Wicken still retains its virgin soil and flora, unspoilt by drainage

or cultivation. It is there every beginner may see that most beautiful of our butterflies, *Papilio Machaon*, in a state of nature. To those who are denied the opportunities of seeing the diurnal Lepidoptera of the tropics, it is some consolation to observe this handsome creature sailing along, or sunning itself on some uncommon marsh flower. Such a sight cannot fail to give pleasure to one with an appreciation of nature, whether he be entomologist or botanist.

Wicken Fen is to be found near the north bank of the River Cam, some fifteen or sixteen miles below Cambridge, and near to the small village of Upware. The best way to get from London is by Great Eastern Railway to Waterbeach Station, which is a little distance after passing Cambridge. We are then some five miles from Wicken Fen; but we have taken the precaution to write to Mr. William Denson, mine host of the little inn at Upware, bearing the odd sign of "Five Miles from Anywhere." We have written with the primary object of securing one or two of the limited number of beds to be there obtained; and, secondly, to ask him to meet the train with his conveyance that he may drive us and our luggage to his hospitable house. To one who has never before visited the fens, this drive is of interest, for it is through a most characteristic piece of cultivated fen-land, which has been reclaimed from what must have been at one time a very extensive tract of marsh. Wide and deep ditches are on each side of the road, while beyond is a broad expanse of perfectly flat landscape, relieved only by clumps and rows of tall poplar trees to be seen here and there in the distance. It is well we are riding, for the long straight roads, with such monotonous scenery, would sadly discourage a pedestrian. In about an hour we are at our journey's end, and, after the adventure of all being ferried across the river, we find Mrs. Denson awaiting us with a savoury and thoroughly country dinner, for which our long journey has prepared us.

Naturally our first question on arrival is about Wicken Fen. It is pointed out to us, and, from a little distance, appears like a brown overgrown meadow. We start away to our work and take the road from the river, and, passing a few houses, we come to some ash trees on our right. These are quite historical in entomologists' annals. About 1850 it was here Mr. Bond took at sugar *Acronycta strigosa*, in company with *Cidaria sagittata*, both

at that time very rare; and, flying over the oats just over the fence, he also took the then new *Cosmopteryx Lienigiella*. In the same field he also took the very rare *Argyrolepis Schreiberiana*, and, for the first time, discovered *Eupithecia viminalis*, then supposed to feed upon osiers (*Salix viminalis*), but now known to feed on the flowers of the *Valerian*. Passing these ash trees we come to a gate leading on to a wide bank; following this we arrive at a small pumping-engine, and opposite this we may cross the ditch into the fen proper.

On entering the fen we find that our first impression of a brown meadow gives way to a more pleasant one, when we see that the growth consists of many marsh plants seldom found in such abundance. Conspicuous amongst these are sedges, reeds, yellow iris (*Iris pseudo-acorus*), yellow loosestrife (*Lysimachia vulgaris*), purple loosestrife (*Lythrum salicaria*), comfrey (*Symphytum officinale*), meadow-sweet (*Spiraea ulmaria*), meadow rue (*Thalictrum flavum*), dwarf salallows, and hog's-fennel (*Peucedanum palustre*), the food-plant of *Papilio Machaon* larvæ. In addition to these plants are several rarer and interesting species, especially of the genus *Ranunculus*. As may be understood, the fen is frequently very wet, even in summer during some seasons. It is intersected with deep ditches, and surrounded by broader dykes, locally known as "loads." On these may be seen the long narrow fen-boats laden with peat for fuel or with cut and dried sedge, which is used in the district for bedding for cattle or for thatching. The total extent of Wicken Fen is about three miles long by one mile broad.

Should we, on our visit, have the bad luck to meet with wet or windy weather we shall fare badly with our captures. There is no shelter from the wind, which sweeps across the broad expanse of country with such force as to make flight impossible for all but the strongest insects. Should we, however, be more favoured with a warm sunny day any time between the end of June and end of July, we shall soon get a sight of the beautiful "swallow-tail" butterflies.

When perfect insects are scarce we shall find plenty to occupy us at the various times of the summer season with looking for larvæ. I will name a few of the many species we may expect, although, of course, not all at once, but each in its turn, which may be easily ascertained. On the sedges *Orgyia cænosa* used

to occur sometimes in abundance, but of late years it seems to have become very rare; last season, only one specimen being noticed so far as I can ascertain from those who visited the fen. In June and July the larvæ of various *Leucanidæ* may be found at night on the reeds (*Phragmites communis*); those of *L. pudorina* not being uncommon. The perfect insects of this genus are sometimes in great abundance, flying over the herbage after dusk later in the season. In the stems of the reeds the larvæ of *Macrogaster arundinis* feed with those of *Leucania phragmitidis* and *Chilo phragmitellus*. A good way of collecting the imagines of these species is to examine the freshly-cut reed and sedge stalks at night with a lantern. They are then often found just after emerging from the pupa-cases. This applies to other species, such as the scarce and variable *Senta ulvæ*, although at another period of summer. *Callimorpha dominula* is another curious case of an abundant insect becoming rare in this locality. A few years ago it was common at Wicken; the larvæ could be found in spring feeding upon almost every species of plant growing there, but apparently most preferring the meadow-sweet. It is now no longer common; in fact, in some seasons, being quite scarce. In June the larvæ of *Chelonia caja* abound upon the comfrey; a large number may be taken on a single sunny morning. On the bedstraw (*Galium*) *Cherocampa elpenor* may be found also as a larva, while upon the sedge, *Simyra venosa* is frequently in numbers. *Sesia bembeciformis* may be found boring the willow stems, and the great fat larvæ of *Lasiocampa quercifolia* stick closely under blackthorn stems by day. *Saturnia carpini* are common on meadow-sweet and willow in early autumn. All the larvæ mentioned should be collected, if possible, for many fine varieties have been bred from the fen-lands.

During the last few seasons the chief mode of collecting Lepidoptera in the fens has been with light. This has been found by far the most successful means used for making large "bags" of rare and local species which could not be allured by the charms of "sugar," or indeed any other bait. The way to proceed is to get a "lighthouse," which may be obtained at one of the shops where we buy our other entomological apparatus. It consists of a glass case some two feet square affixed on a pole about six feet high. In this glass case are placed two or four paraffin lamps, as large as can be conveniently managed. These

lamps are lighted when the darkness of night has set in. After we have placed our lighthouse in a conspicuous place which will command a good area of the fen, behind our lighthouse, or more correctly, to windward, we must spread a sheet stretched on two poles. This has a double advantage of sheltering our lamps from the wind, while at the same time it forms to some extent a reflector and convenient background on which to see any specimens which fly past the lantern. Having selected our ground and got all in order we light our lamps. At the same time it will be as well to light our pipes, and, if we can also muster some "yarn" about the great catches of other people, it may encourage us, for we must not expect all the good things in the first hour. Watching a light for Lepidoptera is a fine exercise for our patience. We may have to wait an hour—even two, three, or more hours—before our first insect appears; on some nights indeed our visitors do not come at all. But when they do come, as said the historian of John Gilpin,

"May I be there to see."

Nearly all groups of Lepidoptera have been known to visit the light in a single night, even butterflies. The rule for such a night seems little understood as yet, and we can recommend no better subject for the study of our readers. An apparently good night frequently produces little or nothing, while sometimes those collectors who have had the patience or perseverance to stay through a wet and windy night find that suddenly the moths begin to come, and many rarities are unexpectedly taken. Lights may be successfully used the whole summer through, when the nights are favourable. Amongst the many insects to be taken are the rare *Hydrilla palustris*, which, until so attracted, was a species represented by single specimens in one or two collections only. *Meliana flammea* and *Nascia ciliaris* were almost as rare, but have since appeared in most of the best collections, if only in some cases as types. Amongst the more plebeian herd are the pretty *Bankia argentula* and *Hydrelia unca*; while at times *Apamea unanimitis* and *A. fibrosa* abound, with an occasional *Macrogaster arundinis* or *Simyra venosa*, and crowds of *Phibalapteryx lignata*. In addition to these we get on a good night many strange and uninvited guests, such as bats, beetles, flies, with numbers of *Chelonia caja*, which flounder about and drive away our more aristocratic visitors. Enough I think has from time to time

been said and written on the subject of light in the fens to show its success. I need, therefore, simply wish that our reader may on his visit to Wicken have the good fortune to see a "real night for light," and hope he may use his time to good advantage.

Sugar has latterly been somewhat at a discount amongst collectors at Wicken, but at times it produces a rich harvest. There are several clumps or rows of poplar trees near Upware on either side of the river. These may be often found very profitable if sugared. These trees do not stand in the fen itself, but are surrounded by dykes and fenny land in every direction. At these trees, when sugared, have been taken all the following and many other species:—*Acronycta strigosa*, *Cymatophora ocularis*, sometimes a dozen in a single night, *Apamea ophiogramma*, *A. fibrosa*, *Hadena atriplicis*, *H. suasa*, &c. A sharp look-out should always be kept for the exceedingly rare *Hadena satura*, which might be overlooked for an odd *H. thalassina*. One of the very limited number of places where this great rarity was taken was in Cambridgeshire. Many of the commoner Noctuæ taken at sugar in the fens are well worth looking over, for many odd forms appear amongst them from time to time. These bear examination from other views beyond those of the mere collector, and are curious to those who study development of varieties or types as associated with surrounding circumstances.

I have already mentioned a couple of nearly extinct species which used to occur commonly at Wicken. Space will not now permit us to discuss the causes which have led to this apparent extermination of certain species in certain localities. I must not, however, forget to remind our readers that at one time the now rare *Phibalapteryx polygrammata* used to occur between Upware and Wicken villages in some abundance. Mr. Bond informs me that at one time he could have taken large numbers in Burwell Fen, which was immediately south-east of Wicken Fen and adjoining. *P. polygrammata* was also taken in Wicken, but more sparingly than in Burwell. There were two broods, one in April and the other in June, and, like its relative, *P. lignata*, the summer form was the larger. Not for years has this species been seen, although carefully searched for by many collectors. Burwell Fen, the headquarters of this insect, has been drained, and is under a rough kind of cultivation, but Wicken still remains,

and only separated by a twenty-foot dyke, known as Burwell Load. The moth may turn up again, and is always worth looking for.

Amongst the most striking of our Geometers to be found at Wicken is *Cidaria sagittata*. The larvæ may be found on the seeds of the meadow rue in August, frequently in goodly numbers. The pretty *Hyria auroraria* is sometimes not uncommon, neither are the two "pugs," *Eupithecia subumbrata* and *E. pygmaea*.

Wicken is a grand field for the student of the British Tortrices. Many are the local and rare species he may take there during a short summer holiday, either as imagines or in the larval condition. As an example I may mention *Tortrix dumetana*, *T. costana*, *Peronea hastiana*, with some beautiful and curious varieties. The larvæ of *P. Shepherdana* are found along with those of *P. aspersana* in rolled-up leaves of the meadow-sweet in June, and will repay the trouble spent upon collecting them. The imagines of these species are found sitting upon the leaves of that plant commonly in August. Another local species is *Dictyoptyryx uliginosana*, which is double-brooded, and appears in June and September. In June, also, may be found, but not commonly, *Penthina carbonana*, while *Sericoris herbana* is taken in July with *S. micana* and *Phoxopteryx paludana* in June and August, and many others.

Of the plumes, *Pterophorus bipunctidactylus*, *P. lithodactylus*, *P. microdactylus*, and the very rare *P. paludum* are represented. The latter is seldom taken, but is possibly overlooked, being a small and obscure species.

That large division of the Lepidoptera, the Tineina, is especially favoured at Wicken. Many rare and some new species may still, no doubt, be found. The genus *Depressaria* is rich in its members. The strikingly black and white *Anesychia funerella* is not known to occur elsewhere in this kingdom; it is frequently found in some numbers. So conspicuous a lepidopteron must have greatly pleased its re-discoverers, Dr. Bree and Mr. Bond, when first found by them. The genus *Gelechia* will alone well occupy much of one's time at Wicken, if we wish to succeed in obtaining a better knowledge of its species. One has been latterly added to the British list from that fen, namely, *Gelechia marosa*. Other rarities to be found there are *Laterna phragmitella*, which feeds in the seed-heads of the reed-mace (*Typha latifolia*). An interesting

figure is given in Mr. Stainton's beautiful work, 'The Natural History of the Tineina' (vol. xi.). *Cosmopteryx orichalcella* is to be taken amongst the fescue-grass (*Festuca pratensis*), and will repay a diligent search. Space will not permit of a further list of Lepidoptera to be taken at Wicken, but I can confidently predict many pleasant surprises in store for the hard worker who has never before been to the fens.

My experience of Wicken this year was confined to a visit of two days early in June, in company with Mr. Meek, who kindly showed me the localities in the fen for many of the best species. The weather was of the most unfortunate character a collector could well meet with; the rain was frequent and heavy, and the wind was constant. The result was that we did not take a single lepidopterous imago in the fen, but our trouble in collecting various larvæ was well repaid. I bred some very fine *Peronea hastiana*, with some of the rarer varieties. This species must, I think, be double-brooded, for my specimens were all out and set by the end of June. This is confirmed by other correspondents who have also bred it during the summer. At sugar we found many Noctuæ, but none of the rarer species.

To the lot of few of us does it now occur to take several species new to our fauna in one season, but such was the case when Mr. Bond went to Wicken for the first time. This was, as I have already said, about 1850. In that year he added to the British list, I believe, *Schœnobius mucronellus*, *Anesychia funerella*, which was only doubtfully British; *Nascia ciliaris*, which had not occurred for thirty years before. In fact, I believe Mr. Bond, who then lived at Cambridge, was the first entomologist who worked this fen with system, at any rate. He was frequently assisted by a man who lived at Fulbourne named Osborne. Mr. Doubleday used to have most of Osborne's Lepidoptera, and Mr. Wollaston his Coleoptera. All the fen species were rare in those days, and the application of light was not used as an attraction for moths.

Before closing this article I should say that another way to go to Wicken Fen is by Wicken village. This is reached from Soham Station on the Newmarket and Ely Railway; but Wicken village is some distance from the station. Accommodation may sometimes be obtained there, but I prefer the Waterbeach and Upware route, on account of its being a shorter railway journey from London, and, still better, you get a hearty welcome from the

host of the "Five Miles from Anywhere," who has for many years been used to the eccentricities of entomologists, and who can tell them where to work for many species. Whichever way is chosen, it is well to write first to see if a bed can be obtained, for the visitor must not expect to find a "grand hotel" with an unlimited number of apartments near Wicken Fen.

Royal Aquarium, Westminster, July, 1880.

A FEW REMARKS UPON CERTAIN DIPTEROUS INSECTS.

By R. H. MEADE.

HAVING spent a few days towards the latter end of last June in Buckinghamshire and the neighbouring parts of Oxfordshire, I am induced to make a few remarks upon some interesting Dipterons which I noticed in those localities. This order is so extensive that I shall confine my observations almost exclusively to the members of one family, the *Anthomyiidae*, which are very interesting, though they have received but little attention.

The first species to which I shall allude is *Ophyra anthrax*, Mgn. On a hawthorn hedge by the side of the road, on the outskirts of the town of Buckingham, I found this little blue-black fly in immense numbers. Some years ago I noticed it before in the same place, but I have never seen it in any other locality, though I have looked for it in various parts of England. Nearly opposite to the hedge in question, on the other side of the road, there is a bone-mill, in which bones are ground up for manure; and I noticed that a very strong putrescent odour emanated from it. This smell evidently attracted the flies, for they were most numerous on that end of the hedge which was nearest to the mill. This peculiar species seemed to have almost exclusive possession of the locality, for, with the exception of a very few individuals belonging to the larger species of the same genus (*Ophyra leucostoma*, Fall.), I noticed no other flies among them. On referring to the accounts given of this species by systematic authors I found, in Schiner's 'Fauna Austriaca' (Diptera), the remark that it is of local occurrence, and that he once found it in countless numbers ("in wahrer Unzahl") near a dead horse. What is the source of attraction? Do the larvæ feed upon

carrión? The flies I saw were almost all of the male sex; out of fifty which I captured only two or three were females.

After leaving Buckingham I stayed for several days in a retired country parsonage within the borders of Oxfordshire, and I found the garden, shrubbery, and immediately surrounding country very rich in rare and interesting species of Anthomyiidae. A dry enumeration of the names of those which I captured would be of little interest, so I will only mention those which are particularly rare, or peculiar in their habits.

Under a large standard apple tree in the kitchen garden I noticed, on a sunny day following a wet morning, a number of *Homalomyias* performing a joyous aerial dance, such as all the flies belonging to this genus are fond of doing. Upon watching them I observed that they were of three distinct kinds and sizes; some were small and grey in colour, others rather larger and blacker; and, darting between these, and glistening in the stray beams of sunshine which stole through the leaves of the tree, were a few individuals of a still larger size and brighter colour sporting with the rest. I captured one or two of each kind with my forceps, and found them to be *H. canicularis*, Lin., *H. scalaris*, Mgn., and *H. aprica*, Hal. The two former are common everywhere indoors and out, but the last, which is the largest species in the genus, must be considered rather rare, though it is widely distributed. The interest here attaches to the circumstance that three distinct species were sporting and associating together. Is this usual? As I believe is always the case, the flies performing this dance were all males.

Pyezura pardalina.—On a shrub in the garden I captured a rare Dipteron closely allied to the *Homalomyias*, but placed in a separate genus by its discoverer, Prof. Rondani, who named it *P. pardalina*. It differs from the *Homalomyias* by having a plumose instead of a bare arista on the antennæ. This little fly has hitherto only been recorded as a native of Italy, not being mentioned in any of the works I have seen on the Diptera of France, Germany, or Scandinavia, as well as England. I am sorry to say I only found a single male specimen, though I carefully searched for others.

Hyetodesia (Aricia) abdominalis, Zett., and *Hydrostæa velutina*, Desv.—I will only mention these two other Anthomyids, both of which I found. Both are rare; the former is recorded by Walker as British, but I had not previously seen it; the latter has not been

found before in England to my knowledge, and is very rare on the Continent.

In conclusion, the only fly belonging to another family to which I shall allude is the *Morellia* (*Cyrtoneura*) *curvipes*, Macq. I had formerly captured several males of this rather rare Muscid in the same neighbourhood, but on the present occasion I found numbers of both males and females (the latter I had not previously seen) on the leaves of strawberry plants in the garden.

Bradford, Yorks, July, 1880.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

BY J. B. BRIDGMAN AND E. A. FITCH.

No. II.—ICHNEUMONIDÆ (*continued*).

SECTION 5.—Scutellum and abdomen black: apex reddish or fulvous.

Tarsi and tibiæ yellow (B) or saffron (A), apex of hind one black.

A. Intermediate segments of abdomen rufo-fulvous at the sides.

122. *dubitatus*, 6 lines.

B. Intermediate segments not so marked.

111. *ancipiterus*, 6—6½ lines.

SECTION 6.—Scutellum pale; abdomen red and black; apex with white or whitish marks.⁽¹⁾

A. Middle area of post-petiole aciculate; supero-medial area of metathorax rectangular or subquadrate (females).

Subdivision I.—Antennæ filiform or the apex slightly attenuated, rather stout, after death involuted; mesothorax a little higher than the metathorax.

Scutellum white or yellowish.

a. Hind coxæ pubescent beneath.

* 2nd and 3rd segments either entirely red, red and black, or sometimes quite black; tibiæ, especially the hinder ones, reddish at the base; femora black. 30. *computatorius*, 6—9 lines (a).

** 2nd and 3rd segments, the latter with a black basal band and hinder femur, red; apex black, and tibiæ the same.

32. *vaginatorius*, 5—6 lines.

*** 2nd and 3rd segments red; hinder tibiæ with a wide straw-coloured band in the middle. 34. *confusorius*, 5—7 lines (a).

b. Hind coxæ not pubescent beneath; greater part of the femora black, especially the hinder ones.

(1) Generally it is the last two or three segments that are pale marked, sometimes the last four, and sometimes only the last: these marks often vary in the same species

- † Margins of cheeks descending more or less below the base of the mandibles; 2nd and 3rd segments of abdomen red.
- † Tarsi and tibiæ red; apex of hinder one black.
- § Scutellum white. - - - 35. *bucculentus*, 6—9 lines (a).
- §§ Scutellum whitish yellow. - - - 37. *gracilentus*, 5—6 lines.
- †† Tibiæ whitish straw, apex of front one red-brown, apex of hind one black. - - - 36. *suspiciosus*, 6—9 lines (a).
- †† Margins of cheeks not dilated below the base of the mandibles. 2nd and 3rd abdominal segments red.
- × Hind tibiæ in the middle straw or whitish straw-coloured.
- * 3rd segment with a short black basal band. 38. *terminatorius*, 6—9 lines.
- ** 3rd segment with the black band; this and the 2nd, chestnut marked with black, or entirely black. 39. *melanotis*, 7—8 lines (a).
- × × Hind tibiæ red or reddish straw-coloured at the base.
- * 1st to 3rd abdominal segments red. - - 46. *multipictus*, 3 lines.
- ** 2nd and 3rd segments red, 4th sometimes partly so. 42. *luctatorius*, 6—8 lines.
- × × × Hind tibiæ black. - - - 43. *militaris*, nearly 4 lines.

Subdivision II.—Antennæ setaceous, after death incurved or subinvolved, apex distinctly attenuated; mesothorax and scutellum generally much higher than the metathorax; hinder coxæ not pubescent beneath; 2nd and 3rd abdominal segments red, the 3rd in both sexes generally transverse.

- a. Scutellum yellowish or white.
- * Gastrocæli of 2nd segment of the abdomen rather large, the space between them equal to the width, or only a trifle wider than the middle area of the post-petiole.
- † Femora black.
- † Spot on coxæ and base of tibiæ yellowish, especially the hinder one. 48. *primatorius*, 10—11 lines.
- †† Tibiæ red, apex of hinder one and coxæ black. 53. *formosus*, 5½ lines.
- †† Greater part of femora red.
- § Hind knees black. - - - 50. *gracilicornis*, 4—5½ lines (a).
- §§ Hind knees not black.
- × Middle area of metathorax subquadrate. 52. *quadrialbatus*, 4—5 lines.
- × × Middle area of metathorax wider than long. 49. *bellipes*, 7½ lines.
- ** Gastrocæli of the 2nd segment smaller, the space between them wide, mostly wider than the middle area of the post-petiole.
- + 2nd and 3rd abdominal segments red.
- o Tibiæ red, yellow in the middle. 54. *caloselus*, 5—6 lines (a).
- oo Tibiæ red, apex of hinder one black.
- ++ From the base of 2nd segment to the apex of the 5th the sides are parallel. - - - 56. *subcylindricus*, 6 lines.
- ++++ Abdomen not thus narrowed in the middle.
- ∞ Upper margin of the collar sordid white. 55. *cadator*, 4—4½ lines.

- Collar not pale marked; apex of 1st segment frequently red.
57. *raptorius*, $3\frac{1}{2}$ —5 lines (a).
+ + 1st to 3rd abdominal segments reddish; 5th, 6th, 7th (or 6th and 7th) marked with white.
* Basal segments dark brown. - 29. *punctus*, $4\frac{1}{2}$ — $5\frac{1}{2}$ lines (l).
** Basal segments red. - 59. *rufidens*, 4 lines.
b. Scutellum more or less, and 1st—3rd abdominal segments, red.
vulneratorius, $3\frac{1}{4}$ —4 lines (h, t, l).
B. Middle area of post-petiole strongly punctured (females).
Gastrocæli of 2nd abdominal segment small, the space between them wider than the middle area of the post-petiole.
Segments 1—3 and sometimes 4 more or less red, apex as well as sometimes the petiole black; 6 and 7 or 5—7 white marked; greater part of legs generally red.
a. Vertical orbits black. - 90. *lepidus*, 4—6 lines (a, l).
b. Vertical orbits marked with red. 88. *vestigator*, 4—5 lines (l, a).
c. Vertical orbits whitish.
* 4th abdominal segment without white apical fascia.
† 3 superior areas on the metathorax. 94. *callicerus*, $3\frac{1}{2}$ —4 lines.
†† 5 superior areas on the metathorax; femora black.
97. *bilunulatus*, $2\frac{1}{2}$ —4 lines (s).
** 4th—7th abdominal segments with white apical mark; front, and base of hind, tibiæ red. - 95. *angustatus*, $4\frac{1}{2}$ lines.
C. Middle area of post-petiole smooth (females).
a. 1st—4th abdominal segments red; 6th and 7th white on the back; femora and tibiæ red, apex of hind black.
104. *ridibundus*, 3—4 lines (f, t, l).
b. 2nd—6th segments towards the apex red; hind coxæ beneath with several raised lines; legs varied with brown and pale.
76. *varipes*, 2— $3\frac{1}{2}$ lines (s, l, a).
A. Middle area of post-petiole aciculate (males).
2nd and 3rd segments of abdomen entirely red; sometimes (a) more or less spotted or marked with or (**) almost entirely black; femora dark, tibiæ partly red.
a. Scutellum and marks on the face, thorax, and abdomen white.
* 2nd and 3rd segments without punctures.
58. *septemguttatus*, 6 lines.
** Abdomen closely and finely punctured.
29. *punctus*, 5—6 lines (l, a).
b. Scutellum and marks on the face, thorax, and abdomen whitish or yellowish.
3rd segment transverse. 50. *gracilicornis*, 6—8 lines (h, s, a).
B. Middle area of post-petiole punctated (males).
Gastrocæli small; 1st—3rd abdominal segments red; petiole more or less black; apical segments white-marked.
a. Vertical orbits not marked with white.
90. *lepidus*, 4—6 lines (h, l, a).
b. Vertical orbits marked with white.
* Stigma fuscous, base pale. - 89. *chionomus*, 3— $3\frac{1}{2}$ lines.
** Stigma not pale at the base.
† 1st segment of abdomen black, and nearly the whole of the legs.
† Scutellum with 2 apical spots sometimes confluent.
92. *octoguttatus*, 4—6 lines.

- †† Scutellum white. - - - 95. *angustatus*, $3\frac{1}{2}$ —4 lines (*a*).
(Wesmael says the abdomen is a little more thickly punctated than in *vestigator*.)
- †† Post-petiole more or less red.
- § Metathorax with 5 superior areas. 88. *vestigator*, 4—5 lines (*h*, *t*, *l*.)
- §§ Metathorax with 3 superior areas. 94. *callicerus*, $3\frac{1}{2}$ —4 lines (*l*, *a*.)
- C. Middle area of post-petiole smooth (males).
- a. 2nd—5th abdominal segments red, 6th—7th white 104. *ridibundus*, 3—4 lines (*h*, *l*, *a*.)
- b. Margin of middle segments red or piceous. 76. *varipes*, 2— $3\frac{1}{2}$ lines (*l*.)
- Doubtful species; structure not described
- A. Females.
1. Scutellum fulvous; ring of antennæ reddish yellow; tibiæ red, apex of hinder one black.
Segments 2 and 3 tawny red; 5, 6, 7 marked with white. 125. *fulvoscutellatus*, 6 lines.
2. Scutellum white or whitish.
Segments pale saffron, remainder each with a large triangular white spot; legs red; knees, hind tarsi, and apex of hind tibiæ black. - - - 139. *quadrinotatus*, 4 lines.
3. Segments 2 and 3 red, base of 3rd black; apex of last 3 segments with a white spot; tibiæ yellow; apex of hinder black; vertical orbits of eyes pale. 117. *concinctorius*, 7 lines.
- B. Males.
- * Antennæ black.
Femora, tibiæ, 2nd and 3rd segments of abdomen, red; sides of 4th—6th glaucous, 7th with a dorsal macula of the same colour - - - 127. *interruptus*, 6 lines.
- ** Antennæ with white marks in the centre.
2nd—4th abdominal segments chestnut; 6th—7th whitish yellow; greater part of legs black, front ones partly pale. 118. *cubicularis*, $3\frac{1}{2}$ lines.

SECTION 7.—Scutellum black; abdomen red and black; apex pale marked.

A. Head black, orbits not pale; in *analis* with a thin red line (females).

Antennæ tricoloured; abdomen red; apex black, marked with white.

- a. Legs (including coxæ) red, apex of hinder black, middle area of post-petiole aciculate. - - - 45. *latrator*, $2\frac{1}{2}$ — $3\frac{1}{2}$ lines.
- b. Tibiæ red, apex of hinder black, middle area of post-petiole with no sculpture. - - - 47. *spurius*, $2\frac{1}{2}$ lines.

B. Head with the orbits more or less pale (females).

* 1st abdominal segment entirely black; greater part of legs dark.

† 2nd and 3rd segments more or less sordid chestnut.

65. *gemellus*, $5\frac{1}{2}$ —7 lines.

†† 2nd—4th segments chestnut red. - 118. *cubicularis*, $3\frac{1}{2}$ lines.

** 1st and 4th segments more or less red, 2nd and 3rd entirely so.

- † Hind femora red. - - - 89. *chionomus*, $2\frac{3}{4}$ — $3\frac{1}{2}$ lines.
 †† Hind femora black.
 c. Middle area of post-petiole punctated.
 § Gastrocæli distinct. - - - 92. *octoguttatus*, 5—6 lines.
 §§ Gastrocæli obsolete. - - - 96. *derogator*, 4 lines.
 d. Middle area of post-petiole finely aciculate. 66. *analis*, 3— $3\frac{1}{2}$ lines.
 C. Antennæ white-ringed; 2nd and 3rd abdominal segments red,
 5th, 6th, 7th white; tibiæ testaceous; post-petiole aciculate
 (male). - - - - - 53. *formosus*, 6 lines.
 (To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VARIETY IOLE OF APATURA IRIS.—Last week, while spending a few days in Sussex, I had the good fortune to add to my collection the variety of *Apatura Iris* named *Iole*. As usual, the good luck of capturing a variety fell to a beginner, who, although taking but three specimens of *Iris*, took this variety settled low down on a small oak. Upon learning the rarity of his capture Mr. Percy Eley kindly gave it to me. *Iris* was tolerably common, and if I can only induce the female I have to deposit eggs, I trust I may be able to rear some imagos next season. As I was not seriously bent on collecting I caught but few species. *Pionea stramentalis* was very common. I have met with this species often before, but never saw it in such numbers; it was flying in company with *Ebulea crocealis*. Among other species I saw *Aventia flexula*, *Cleora lichenaria*, *Macaria notata*, *Scotosia undulata*, *Dichelia Grotiana*, &c. In midday, with the sun shining hotly, I caught a female of *Zeuzera æsculi* flying high up over beech trees. I watched it some time (before it came within reach) flying over the dense wood, and was much puzzled by its appearance. On the golden-rod were larvæ of *Cucullia asteris*, but a careful search did not result in the finding of that of *Cucullia gnaphalii*.—A. B. FARN; Dartford, July 23, 1880.

A WEEK IN THE NEW FOREST.—On the 10th of this month I went to Lyndhurst for a week's collecting. Strange to say, there were very few entomologists in the New Forest, possibly on account of its being apparently a bad season; the local collectors state they do not remember such a bad one for some years. Sugar-ing was of little or no use, only producing some half a dozen worn *Leucania turca*, two *Diphthera Orion*, *Thyatira batis*, *Euplexia*

lucipara, and a few common insects; in the daytime I took *Boarmia roboraria*, *B. repandata* var. *conversaria*, *Tephrosia biundulata*, *Lithosia mesomella*, *Zygæna loniceræ*, *Lycæna Ægon*, *Eutemonia russula*, *Metrocampa margaritaria*, *Limenitis Sibylla*, *Argynnis Adippe*, and a nice series of *A. Paphia*, including a fine specimen of the var. *Valezina*; at dusk, *Cleora viduaria*, *Melanthia albicillata*, *Ypsipetes elutata*, *Pseudopteryx cytisaria*, and many other *Geometræ*. I also saw taken by a young lady, a fine female *Apatura Iris* just emerged, the empty pupa-case sticking to a rush, on which the larva had spun up, having probably fallen when full-fed from a sallow bush close by. A few things only came to light, *Agrotis porphyrea*, *Notodonta camelina*, *Caradrina blanda*, and *Chelonia caxa* being amongst them. Beating yielded some good larvæ—*Notodonta chaonia*, *N. dodonæa*, *N. trepida*, *Liparis monacha*, *Amphydasis prodromaria*, *A. betularia*, *Boarmia consortaria*, and many others "too numerous to mention," *Tæniocampa stabilis* being a perfect pest. I also saw a half-grown larva of *Acronycta alni* beaten out. By tree-trunk searching I obtained pupæ of *Lithosia quadra*, *Liparis monacha*, and *L. chrysorrhæa*. On the 17th inst. I returned to London, having done a fairly good week's collecting. One of the most curious things in connection with this season is that many pupæ appear to be standing over. I have in my cages *Smerinthus ocellatus*, *S. tilia*, *Bombyx callunæ*, and *Saturnia carpini*. Many larvæ, such as *Triphæna fimbria*, were common enough in the spring, and now no imagos seem to be about, or only very few. I may remark *en passant* that at the "Crown and Stirrup," at which I stopped, the entomologist is made welcome, and the house certainly is one of the most comfortable and moderate in its prices of any place at which I have made a stay.—P. J. LOWREY; 61, Hackford Road, S.W., July 21, 1880.

LEPIDOPTERA AT WICKEN.—From June 14th to 26th last, I spent at Wicken, collecting Lepidoptera, in company with the Rev. T. W. Daltry, M.A., of Madeley, and several other friends. The weather was not favourable for fen work—north-east winds the first week were followed by very much rain in the second. *Papilio Machaon* was plentiful on the few sunny days we had, and its eggs were also tolerably easy to find on the upper side of the leaves of *Peucedanum palustre*. *Macrogaster arundinis* and *Meliana flammea* were taken sparingly most nights at our lamps, and I took a fine female of the latter at sugar. That is not

usually a habit of the species, so its presence in this case may have been more by accident than otherwise. The three moths most abundant were apparently *Apamea unanimitis*, *A. gemina*, and *Chilo phragmitellus*; *A. unanimitis* occurred in thousands all over the fen. Of *C. phragmitellus* we also found larvæ and pupæ in the old reed stems. Other species taken or noticed included *Anthocharis cardamines*, hibernated *Gonepteryx rhamni*, and *Vanessa cardui*, commonly; *Smerintlus ocellatus*, *S. populi*, *Sphinx ligustri*, *Chærocampa elpenor*, were not uncommon; *Sesia myopæformis*, *Arctia fuliginosa*, at the lights at night, also not uncommonly; *Arctia urticæ*, *Liparis salicis*, larvæ on willows; *Pæcilocampa populi*, I beat a larva out of elm in the wood; *Lasiocampa quercifolia*, full-grown larvæ rather common on buckthorn, &c; *Saturnia carpi*, young larvæ; *Epione apiciaria*, common; *Asthenes luteata*, *Eupithecia pygmæata*, and several more common "Pugs;" *Collix sparsata* in fine condition; *Lobophora sexalata*, *Coremia ferrugata*, *C. unidentaria*, *Phibalapteryx lignata*, common, and much larger than specimens of the second brood I took there at end of July and beginning of August two years ago. *Dicranura furcula*, *D. vinula*, *Ptilodontis palpina*, not uncommon; *Notodonta ziczac*, *Acronycta aceris*, *Simyra venosa*, tolerably common; *Leucania pudorina*, *L. comma*, *Mamestra anceps*, a few at sugar; *Rusina tenebrosa*, *Noctua augur*, *N. plecta*, *N. rubi*, *Hecatera serena*, *Aplecta advena*, *Hadena atriplicis*, *H. suasa*, several of each at sugar; *Hydrelia unca*, moderately common, and in good condition; *Plusia chrysitis*, *Herminia cribralis*, common and fine; *Nascia ciliaris*, about a dozen specimens were taken during our stay, but eight of them occurred late one night after Mr. Daltry and I had left the fen on account of heavy rain; *Paraponyx stratiotalis*, abundant; *Halias clorana*, flying at dusk; *Peronea Shepherdana*, larvæ plentiful; *Anesychia funerella*, *Pterophorus microdactylus*, and many other micros.—GEO. T. PORRITT; Highroyd House, Huddersfield, July 8, 1880.

LEPIDOPTERA AT HORNING FEN.—In company with Mr. E. G. Meek I visited Horning Fen, in Norfolk, on the 23rd and 24th of this month. Although the weather was fairly suitable the absence of the perfect insects of Lepidoptera was most marked. Where, in most seasons, many fen species may be found in profusion, next to nothing was to be seen. Our captures did not exceed half a dozen species, and, with the exception of

three specimens of *Apamea ophiogramma*, were those only which are commonly taken there.—JOHN T. CARRINGTON; Royal Aquarium, July, 1880.

VARIETIES OF *LIMENITIS SIBYLLA* AND *ARGYNNIS PAPHIA* IN THE NEW FOREST.—While stopping at Brockenhurst I captured on July 5th a black variety of *L. sibylla* in good condition, and on the 17th I caught a male specimen of *A. Paphia* settled on a thistle-head in one of the rides, which on examination I found had a small white patch on each of the fore wings, which is repeated, but not so distinctly, in the hind wings. I believe this variety is of uncommon occurrence.—ARTHUR J. ROSE; Mutlah Lodge, College Avenue, Hackney.

PUPÆ OF *THECLA QUERCUS* EMITTING SOUND.—A few days ago, while holding several pupæ of *Thecla quercus* in my hand, I was surprised to hear some of them squeak. The sound they produced was something like two stones or marbles being knocked together in rapid succession, with an occasional louder sound. As soon as the sound ceased, a gentle shake set them squeaking again.—H. MACRAE PARISH; Ashfield House, Taunton, July 17, 1880.

VARIETY OF *SATYRUS JANIRA*.—On July 15th I caught a variety of *Satyrus Janira*, a male. It has a large whitish spot at the tip of the right fore wing, occupying nearly a third of the wing, while the left fore wing is of the usual type. The lower half of the hind wings is also nearly white. There is a larger area of white on the left hind wing than on the right. The butterfly had a peculiar appearance when flying. It is unfortunately a little broken.—ID.

NOTODONTA DICTÆOIDES NEAR BARNSELY.—Whilst collecting in Lunn Wood, about three miles from here, on the 21st June of the present year, I was fortunate enough to box a fine specimen of *Notodonta dictæoides* off the side of the shooting-box. This is an unusual occurrence for this neighbourhood.—W. E. BRADY; 1, Queen Street, Barnsley, June, 1880.

VARIETY OF *ABRAXAS ULMATA*.—On June 22nd, whilst catching *Abraxas ulmata* in Bamford Wood, near Rochdale, with a friend, we came across one specimen with smoke-coloured wings, but marked much as usual; perhaps slate-colour would better express

the colour of the wings. It was the only one we saw amongst hundreds of specimens.—J. W. BENTLEY; Stakehill Works, Castleton, near Manchester, July 7, 1880.

SEMASIA JANTHINANA.—In the 'Annales' of the French Entomological Society (5th ser., vol. x., p. 79), after a detailed description of the larva of this Tortrix, M. Clément Lafaury says:—"It lives in the berries of the whitethorn (*Cratægus oxyacantha*), uniting them in twos or threes by means of a gummy substance, so that it can pass from one to the other without exposing itself. It eats the pulpy part of the fruit only, without touching the skin. Its metamorphosis takes place between the stone of the fruit and the skin at the spot where the berries are united. It spins its cocoon towards the end of August, in which it changes to a pupa about the middle of May of the next year; the imago emerges about a month later—that is to say about the end of June."—EDWARD A. FITCH.

TORTRIX DUMETANA.—This insect occurs freely on Wicken Fen in July, but I believe it is not certainly known what its food-plant is there. This year at the end of June I found two green larvæ of a Tortrix in rolled up leaves of the dewberry, *Rubus cæsius*. These I kept separate, and have this day (July 20th) bred a male *Dumetana* from one of them. This therefore settles the question of its food-plant. I see Wilkinson states that Mr. T. Brown, of Cambridge, bred this species from larvæ feeding on oak; and Stainton also gives oak as its food-plant. Is there not some mistake here?—(Rev.) THOS. W. DALTRY; Madeley Vicarage, Staffordshire.

HEPTAULACUS VILLOSUS, Gyll., AT BOX HILL.—On the 28th of June, after a gentle brush up one of the valleys on the south-east side of the hill, I sat myself down to examine the contents of my sweeping-net, and amongst a very heterogeneous mass of immature Hemiptera, Diptera, spiders, &c., I was surprised to find a Scarabædious insect which at first sight seemed to me to be an immature *Aphodius*, but on closer examination I found it to be a specimen of the very rare *H. villosus*, perhaps better known by the old generic name of *Aphodius villosus*, Gyll. The capture of this rarity tempted me to sweep again and again in the immediate locality, and I have several times since tried the same place, but the result has each time been unsuccessful. Mr. Champion, while

beating close in the neighbourhood, at Mickleham, in the same month in 1875, had the felicity of finding one specimen in his umbrella, since which time I am not aware that it has been taken, at any rate so near London. I think previous to Mr. Champion's taking this insect, it had only been met with once before in this country. The exceeding rarity of this Coleopteron is an excuse for this note, thinking it would not be uninteresting to many of your readers to know that there are still good things to be met with in the neighbourhood of Box Hill and its surroundings.—T. R. BILLUPS; 4, Swiss Villas, Coplestone Road, Peckham, S.E.

HAGGERSTON ENTOMOLOGICAL SOCIETY.—The twenty-second anniversary of this Society was celebrated by a dinner at the "Kings' Oak" Hotel, High Beech, on the 11th of July, Mr. John Henderson, President of the Society, in the chair. Owing chiefly to the heavy rain in the morning, many members who were expected did not arrive, and the attendance was therefore not so good as upon previous occasions. During the day the following captures were effected:—Mr. C. M. Allen took a fine specimen of *Triphæna fimbria*, settled upon grass opposite the "Woodman" Inn, at Chingford, in the afternoon; the anterior wings of this specimen are of a dark olive-green colour. *Angerona prunaria* was flying in unusual numbers between eight and nine p.m. *Cidaria fulvata*, *Melanthia rubiginata*, and other common species were very abundant.—W. J. VANDENBERGH, Secretary.

REVIEWS.

The Transactions of the Entomological Society of London for the Year 1879.

It has lately been our annual custom to give a *resumé* of the work done by the Entomological Society of London. This has been so fully and ably performed by Mr. J. W. Dunning in his address, read at the anniversary meeting, that this year it becomes necessary only to reprint his felicitous remarks. They were as follows:—

"The volume of Transactions for 1879 extends to three hundred and fifty pages, and (to say nothing of the several papers printed at length in the Proceedings) it contains twenty-five memoirs, illustrated by eleven

plates and as many woodcuts. The authors are sixteen in number : Messrs. Butler and Charles Waterhouse, four papers each ; Messrs. Baly, Distaut, and Westwood, two papers each ; Miss Ormerod and Messrs. F. Bates, Cameron, Moore, Fritz Müller, Oberthür, Rutherford, Sharp, Trimen, Buchanan White, and Wood-Mason, one paper each. Nine of the memoirs relate to Coleoptera, seven to Lepidoptera, three to Hemiptera, one each to Hymenoptera, Trichoptera, and Diptera, leaving three that do not relate to any one Order in particular. Twenty-two out of the twenty-five are on Exotic, three only on British Entomology. M. Oberthür's paper is published in French ; and communication with South Africa is now so rapid that Mr. Trimen's paper, which was read at our last meeting on the 3rd December, was published and distributed before the end of the month. For the most part the memoirs, though interspersed with valuable remarks on classification, variation, affinities, and distribution, must be considered as belonging to the branch of Descriptive Entomology. Of the papers on subjects of more general interest, I may be permitted to allude to Miss Ormerod's "Observations on the Effect of Low Temperature on Larvæ," to Prof. Wood-Mason's "Morphological Notes bearing on the Origin of Insects," to Prof. Westwood's paper "On some unusual Monstrous Insects," to Mr. Charles Waterhouse's paper "On the Affinity of the genus *Polycetes*," and to Mr. Butler's paper "On the Natural Affinities of the Lepidoptera hitherto referred to the Genus *Acronycta*." Miss Ormerod's observations confirm the view generally held by entomologists, though it is scarcely the popular opinion, that cold has little or no destructive effect upon larvæ, or indeed upon insect-life in any form ; but I do not recall any place where the results of observation are stated with precision of detail, and our member has done well to record the effect of ascertained temperatures upon determined species. The monstrosities mentioned by Prof. Westwood are three butterflies with extra wings or portions of wings, and numerous cases of Coleoptera, Lepidoptera, and Diptera with imperfectly-developed heads, in which the imago retain some portion of the outer covering of the larva or pupa. Mr. Charles Waterhouse introduces us to a wondrous creature, *Euctenodes*, which he provisionally places in the family of *Polycetidae*, and considers allied to the *Hippoboscidae*, whilst Prof. Westwood seems to doubt whether the group should not be referred to the Hemiptera-Heteroptera. But Mr. Butler's paper on *Acronycta* is the most startling, and to a lepidopterist of the ancient type its author must appear a perfect revolutionary. Only last year he excited some little astonishment by promulgating the view that the *Ægeriidae* have nothing to do with the Sphingæ, and that their affinities are with the *Pyralidina* and *Gelechiidae*. I have not heard of any attempt to combat this view, and its opponents appear to let judgment go against them by default. Scarcely have the scales fallen from our eyes, and enabled us to see where the clear-winged moths ought to

be placed, before Mr. Butler draws the Grey Dagger, and calls upon us to surrender at discretion, and make humble confession that under the name *Acronycta* we have hitherto huddled together representatives of eight genera belonging to four distinct families; that three-fourths of these so-called Noctuæ are in truth Bombyces; that of our English species *runicis* and *auricoma* are *Arctiida*; *leporina* and *aceris* are *Liparida*; *megacephala*, *strigosa*, and the common dagger-moths *psi* and *tridens*, are *Notodontida*; and that only *alni* and *ligustri* are Noctuæ, the former being the type of *Jocheara*, whilst the latter is relegated to *Mamestra*. Such is the result at which Mr. Butler has arrived, chiefly from a consideration of the larval characters, but relying also upon the wing-venation and structural characters of the moths. That a casual peep at a drawer-full of larvæ should produce such a transformation-scene says little for our lepidopterists; and if Mr. Butler's views are to prevail, it shows that wholesale disintegration of a system, based on mere superficial resemblance of the imago, in which for years we have all been content to acquiesce, may be expected to ensue when attention is paid to the earlier stages, and when, instead of merely collecting so many butterflies and moths and arranging them in a cabinet, the insects are studied *ab ovo*, and their metamorphoses and habits are thoroughly investigated.

"I may say that the interest of our monthly meetings has been fairly sustained; the record of our Proceedings shows that many valuable exhibitions have been made, and important subjects discussed or ventilated. In proof of this statement it will be sufficient to refer to the interesting conversations which have arisen from the introduction of such subjects as, for instance, the stridulating power of the *Mantida*, Brazilian Caddis-flies and their cases, flights of locusts and migrations of butterflies, flowers and their unbidden guests, the destruction of insects by flowers, sericulture, the metamorphoses of the blister-beetle, the mimicry of insects by insects, the effects of temperature upon insects and insect-life, the existence of branchiæ in the imago-state of certain Trichoptera, sculptured markings on cretaceous pebbles from the Lake of Geneva supposed to be due to insect agency, sugar-cane borers, the correlation of mutilation in the larva with deformity in the imago, and variations in larvæ of *Smerinthus ocellatus* fed on different species of *Salix*. It has afforded me additional pleasure to observe how many of the subjects have been introduced or elucidated by the remarks of some of our junior members. This is as it should be. The younger the better and more welcome. The least experienced, if he will make use of the powers of observation with which Nature has endowed him, is sure to see something which is new to the oldest among us. There is a fair field and no favour. Those who have learnt the most are the most ready to learn, and glad to extend the right hand of encouragement to every fresh worker in the field."

E. A. F.

Studies in the Theory of Descent. By Dr. AUG. WEISMAN.
Translated and edited by Raphael Meldola, F.C.S., with a
prefatory notice by Charles Darwin, F.R.S. Part I., "On
the Seasonal Dimorphism of Butterflies."

THIS work is a welcome addition to the literature of Darwinism, and the thanks of all entomologists are due to Mr. Meldola for the excellent translation he has placed before English readers.

It is well known to British entomologists that the form of *Pieris napi*, which appears in the perfect state in the spring, differs very materially from the imagines of the same species which appear in the autumn; the difference is so striking that the late Mr. J. F. Stephens described them as distinct species, and never quite gave up the belief that they were so.

Dr. Weisman, reflecting on this seasonal dimorphism, conceived the hypothesis that, during the glacial epoch, but one form of the insect existed,—probably the spring, or, as, he terms it, "winter form,"—and that, as the seasons became ameliorated, the broods produced from this form had time to pass through all their changes from the egg to the imago in a few weeks, and the summer form of the insect was the ultimate result. These latter laying eggs, which became chrysalids in the autumn, and remained in that state until the next spring, when the perfect insect emerged, thus completing the seasonal dimorphism.

Dr. Weisman's carefully-conducted experiments have placed this hypothesis beyond doubt. By the application of cold to the chrysalids of the summer form he retarded their development, and produced from them the winter form, precisely as is always the case in *Pieris napi*, variety *Bryonia*, which inhabits the high alps, is single-brooded, and appears in one form only, and this much darker than our own winter form. It would thus appear probable, assuming *P. bryonia* as representing the original coloration, that the ordinary winter form has lost something of its colour in acquiring the dimorphic condition.

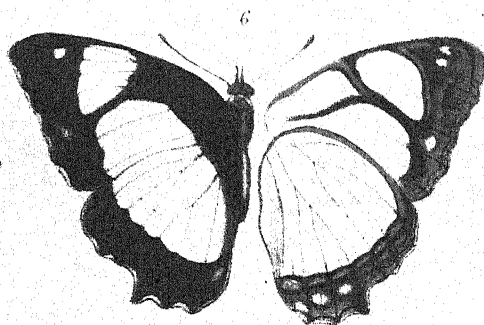
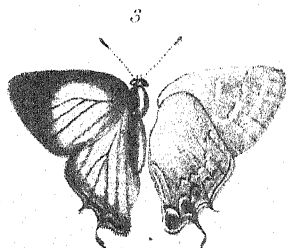
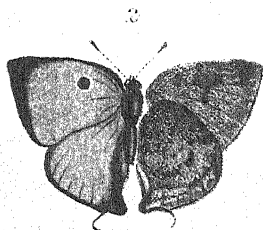
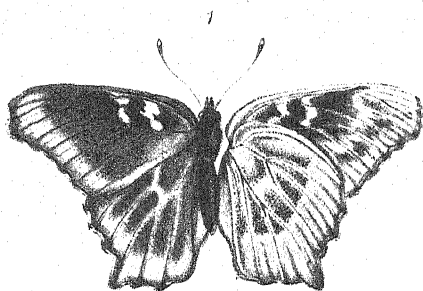
Of our British butterflies, Dr. Weisman draws attention to seasonal dimorphism in *Pieris brassicæ*, *P. rapæ*, *Plebeius Agestis* (*Alexis*, Scop.), *Polyommatus Phlæas*, and *Parargia Aegeria*, but in some of these cases the differentiation is complicated by the effects of local climate. Still these species are well worthy of investigation, although the variation between the summer and winter forms may be very slight.

It is, however, in a species not found with us that Dr. Weisman has made the greater number of experiments, and arrived at some most interesting and instructive results. *Araschnia Levana* is the winter and probably original form of the species which has been differentiated into *Araschnia Prorsa* as the summer form, and often intermediate specimens are produced which are known as *A. Porima*. For the details of these experiments the work should be referred to; they appear to have been carefully made and faithfully recorded.

We look forward with pleasure to the completion of the work by the publication of the second and third parts.—J. J. W.

OBITUARY.

THEODOR HARTIG.—The 'Entomologische Nachrichten' for July 1st contains an obituary notice of this worthy Brunswick entomologist. From it we learn that Theodor, son of chief ranger Georg Ludwig Hartig, was born at Dillenburg on the 21st of February, 1805. In 1833 he was appointed professor of forestry in the University of Berlin, but removed to the Collegium Carolinum of Brunswick in 1838, where he worked hard and to his own great honour for forty years. He died, after two days' illness, on Good Friday last (26th March), in the seventy-sixth year of his age. Hartig's name has frequently occurred in the pages of this journal both in connection with the translation of Vollenhoven's life-histories of sawflies, and as sponsor to the greater number of *Cynipidæ* in the translation of Mayr's work on the European oak-galls. His chief works, all remarkable for their scientific method and accuracy, are 'Die Familien der Blattwespen und Holzwespen' (Berlin, 1837), and 'Einleitung zur Naturgeschichte der Hymenopteren' (Berlin, 1860); his three papers on "Die Naturgeschichte der Gallwespen," in Germar's 'Zeitschrift für die Entomologie' (vol. ii., pp. 176—209; iii., 322—358; iv., 395—422: Leipzig, 1840—3), and his attempt at the classification of the *Aphididæ* (plant-lice) according to their wing-characters, which also appeared in the same publication (vol. iii., pp. 359—376, 1841). The earlier volumes of the Stettin 'Zeitung,' and many other entomological and botanical serials, also contain important memoirs from Hartig's pen; the Royal Society's Catalogue indexes seventy, published between 1835 and 1871.—E. A. F.



1. *Apantia Corona*.

2. *Thecla Cimetium*.

3. *Thecla Ivelia*.

4. *Thecla Cruenta*.

5. *Charis Zabua*.

6. *Pyrrhogyra Arge*.

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THE BUTTERFLIES OF PARAGUAY, AND LA PLATA.

By P. H. Gosse, F.R.S.

(WITH A COLOURED PLATE).

FOR some time past I have been receiving from extra-tropical regions of South America, collections of Butterflies made by my friends, the MM. Richard, William, and Thomas Perrens, young Englishmen settled on Estancias on the W. bank of the River Corrientes, in the Province of the same name, in the Argentine Republic. One or other of them occasionally makes long journeys into the neighbouring State of Paraguay, and always uses his opportunities as a diligent entomologist. Latterly they have favoured me with brief notes of habits, seasons, localities, &c. The results I embody in the following List of species, which is, indeed, a double list, since I distinguish, in every case, the patrial habitat. This may be described as—1. South of the great westerly bend of the River Paraná, to 30° S. lat. = Corrientes; 2. North of that bend, to 24° S. = Paraguay.

I venture to hope that these Lists and Notes of Butterflies (*Hesperidis omissis*) may possess some interest for English Entomologists.

PAPILIONIDÆ.

Papilio Polydamas, Linn. Near Asuncion. Dec. to March. At edges of woods: not uncommon. I receive *Polydamas* from Jamaica, from Pernambuco in Brazil, from Paraguay, and from Corrientes. There are peculiarities in the last-named, which I do not see in the others. On the upper surface of the hind wings the yellow band has much more the character of an even-edged broad ribbon, than a series of arched spots. On the under surface

of the same, the marginal red spots are changeable; being rosy-pink, when the angle formed by the incident and the reflected rays is very acute; orange-scarlet, when this angle is obtuse. Lucas's figure (Lep. Exot. pl. 17) appears to have been taken from this southern form; but he does not notice the changeable hue.

P. Microdamas, Burm. Paraguay, near Asuncion. Edge of a wood: very rare.

P. Perrhebus, Boisd. Corrientes: many examples sent; all caught around trees in the evening. An insect of remarkably slow flight. Paraguay; all parts. Hovering over water in woods. Nov. to Feb.; scarce.

P. Agavus, Dru. Paraguay, near Asuncion. In woods; not scarce. Nov. and Dec.

P. Anchises, Linn. Corrientes: about or near trees; flies, in general, very high; but frequently settles on flowers in the shade. Paraguay; about puddles; rather scarce. Jan. to March.

P. Polyaon, Cr. From Corrientes, and from Paraguay: very rare in both localities. In the latter, taken at the edge of a wood, in Dec.

P. Torquatinus, Esp. Paraguay: Dec. to Mar. About pools; very rare.

P. Lycophron, Hübn. Corrientes. Two or three examples in poor condition sent thence, with no notes. None from Paraguay.

P. Thoas, Linn. In all the collections from Corrientes, where it is evidently an abundant species. The examples are of the full dimensions proper to this noble species. None have yet been collected in Paraguay, though it is known to range from the U. States, through the Antilles, through Guiana, and through Brazil. Dr. Burmeister (Desc. Phys. Arg. Rep.—Lepidopt. p. 59) divides the species into six sub-species, to all of which he gives names. All the Argentine examples he assigns to the one which he diagnoses under the name of *Thoantiades*. But my examples do not bear out his distinctions, as being constant.

Euryades Corethrus, Boisd. Corrientes. Both sexes have been received in some abundance. Always observed in the open; descending to hover over grass or flowers. Dec. to April.

E. Duponchelii, Luc. Corrientes: numerous examples of both sexes. Habits, localities, and seasons the same as those of the preceding. Both are of lofty flight: they rest during the night on trees. Both the species of this interesting genus appear to be

strictly limited to the higher latitudes; not a single example of either having been sent me from Paraguay. Burmeister (*op. cit.*, Atl. pl. 3) has well figured both sexes, and the reverse sides, of both species; and, on an enlarged scale, the curious genital organs. He describes the larva of the latter as feeding on *Aristolochia fimbriata*: the larva of *Corethrus* is still unknown.

PIERIDÆ.

Leptalis Perrensi, mihi. A single example received from Corrientes, with no note. It must have been taken in Sept., and not met with since; nor has it occurred in Paraguay. The specimen agrees very accurately with the figure, No. 3, of Swainson's *Licina Amphione* (Zool. Illustr. ii. pl. 91); which he considers the female. But it differs so importantly from *Pap. Amphione* of Cramer (iii. pl. 232, E, F), that the two cannot be considered the same species. *L. Perrensi* lacks all trace of the orange mark which precedes the yellow band at the tip of the discoidal cell in the fore wings; and the costal bar of orange, broad and reaching the yellow band in *A.*, is short and very narrow in *P.* In the hind wings there is but a single longitudinal band, which is interiorly lemon-yellow, exteriorly rich orange; and there is not a trace of the great palmate yellow band of *A.* Beneath, the colours are arranged as above, but are paler; the black becoming a pale fuscous, especially on the hind wings, in which it greatly suffuses the yellow and orange. Under these circumstances, considering the two forms distinct, and seeing that the earlier name must be retained for Cramer's species, which seems to be the northern form, I assign to Swainson's, the name of my contributors in Corrientes. Dr. Burmeister makes no mention of it in "Lep. de la Rep. Arg."

L. Thermesia, Godt. Paraguay. Nov. to Feb. Banks of brooks: scarce.

Pieris Monuste, Linn. This wide-spread White I receive from Corrientes and from Asuncion: taken from Sept. to March, flitting at edges of woods, but reported "very scarce."

P. Automate, Burm. From Corrientes only: scarce. Settles on wet spots, in paths through woods.

P. Menacte, Boisd. Paraguay. Common near woods.

P. Autodice, Hübn. Corrientes only: common; always in the open. March and April.

Terias Deva, Doubl., and *T. Elathea*, Cr. Both plentiful, in all parts of the open, from Corrientes to Asuncion.

T. Albula, Cr. Not sent from Corrientes, but abundant throughout Paraguay, in open places.

Colias Lesbia, Fabr. Abundant near Goya in Corrientes, where it apparently reaches its northern limit. The male, when very fresh and unrubbed, has a changeable flush of amethystine hue, from the deep orange upper surface, when the incidence of the light is very acute. This is charming, but I am not aware that it has been noticed before.

Callidryas Sennæ, Linn., and its var. (?) *C. Marcellina*, Cr. Both forms abundant; the latter limited to Paraguay.

C. Philea, Linn., and *C. Statira*, Cr. Both of these abundant from Goya to Asuncion.

C. Cipris, Fabr. This also is common throughout. From Paraguay, three very distinct varieties are sent; having the ground colour of each surface respectively, deep fulvous, citron-yellow, and cream-white. The varieties are all small, not exceeding in dimensions Mr. Butler's fig. of *C. Irrigata* (Lep. Exot. xxvi. 2); their marks, on both surfaces, are slight, and even evanescent. The creamy var. has some suffusions of very light green, here and there, below, scarcely observable. I cannot consider these forms to have specific rank. It seems to be, certainly, the *Phæbis Bracteolata* of Mr. Butler.

Goniapteryx Chlorinde, Godt. Near Asuncion, and northward. Rather scarce: Oct. to Feb. Habits those of the *Callidryades*; hovering over pools and lakelets, in the open. A noble species, and well-developed; my examples reaching an expanse of 4 to 4½ inches.

DANAIDÆ.

Danaïs Archippus, Fabr. Common throughout at all times. In open places, generally near woods.

D. Erippus, Fabr. Not from Corrientes, but common throughout Paraguay, with the same habits.

HELICONIADÆ.

Thyridia Themisto, Hübn. Paraguay, from the north bank of the Paraná to Asuncion. Plentiful in some situations, in the woods. Oct. to Jan. A very striking butterfly.

Ithomia hyalina, Fabr. A very elegant little species, with difficulty distinguished from the familiar West-Indian *Ith. diaphana*. It occurred, sparsely, in the woods near Asuncion, from Nov. to Jan.

Tithorea Harmonia, Cr., var. *Megara*, Godt. Of this, which finds no place in Dr. Burmeister's enumeration (*op. cit.*), a single specimen, in battered condition, was sent me from Corrientes, having been taken in Sept. In markings it agrees well with the variety figured in Doub. and Hew., pl. xiv. fig. 2: but the ground-colour is the dull sienna-brown of Cramer's figure, not the fine scarlet which Mr. Hewitson gives to it.

Mechanitis Elisa, Guer. Taken plentifully in woods, in the neighbourhood of Asuncion; from Nov. to March.

M. Ethra, Godt. This elegant species, which might readily be taken for a true *Heliconia*, is still more abundant than the preceding, in the woods of the whole of Paraguay, from the Paraná northward, from Sept. to Jan.

Heliconia Phillis, Fabr. A beautiful, and a wide-spread butterfly, reaching even occasionally to Buenos Ayres, according to Dr. Burmeister. I have not yet received it from Corrientes; but from Paraguay it is sent abundantly, where my friend finds it, from Sept. to March, in the whole region, chiefly in woods.

Acraea Thalia, Linn.; *A. Pellenes*, Hübn.; *A. Anteus*, D. & H.; *A. Mamita*, Burm. All these forms come to me from Corrientes and from Paraguay: the largest, and the most pronounced in colours, from the more northern region. They are reported to occur at the edges of the woods, in the spring and early summer months. But, after examination of a multitude of examples, I cannot resist the conclusion, that they are all varieties of one species, between which no fixed diagnostic lines can be drawn.

NYMPHALIDÆ.

Colænis Phætusa, Linn. One example has been sent from Corrientes; many from Paraguay, where it is described as plentiful, from Nov. to Feb., particularly as the Tropic is approached. It affects open places.

C. Julia, Fabr. Locality and season as the preceding, but rather less abundant. It frequents the margins of woods rather more than its fellow.

Agraulis Vanilla, Linn. The extreme commonness of this

species, in the So. Un. States, in the West Indies, and throughout the vast plains of South America, at least as far as La Plata, tends to render us insensible to its splendid metallic refulgence. Its localities and seasons are those of the preceding two: it is abundant everywhere in the open, from Corrientes to Asuncion.

Euptoieta Claudia, Cr. A single example obtained near Goya, at the end of March, on flowers in an open sandy spot.

Phyciodes Liriope, Cr. Abundant in all parts of the open, both of Corrientes and Paraguay: Sept. to Dec. In this var. the fulvous hue greatly predominates, the black pattern being reduced to a minimum above, and almost obliterated below. But two examples of a variety are sent, from near Asuncion, which is larger, and in which the black so predominates as to give quite a different facies, covering the basal half of the four wings, and leaving only fulvous spots. Cramer's figure (pl. i. c, d) is an intermediate condition. It is said to be taken at the edges of woods: scarce.

Ph. Hera, Cr. A species is sent from Paraguay and still more numerous from Corrientes, which agrees (though not exactly) so well with Cramer's pl. 253, f, g, that I conclude it to be the same, though it is not included by Dr. Burmeister. Sept. to March. Edges of woods, very plentiful in all parts.

Ageronia Feronia, Linn. In woods, near Asuncion, in Nov. Very scarce.

Pyrameis Huntera, Fabr. This most beautiful Painted Lady is spread from New York, through the continent, to Patagonia: for *P. Myrinna* of Doubleday is surely but a strongly marked variety. It is sent me in abundance by my friends from Corrientes, but becomes much scarcer as they go northward.

Py. Carye, Hübn. This seems a peculiarly southern form. I receive it numerous from Corrientes, but not one example from Paraguay. Dr. Burmeister gives Patagonia to Rio Negro as its habitat; and says it is abundant at Buenos Ayres, even in the streets of the city.

Eurema Zabulina*, Godt. Taken in Dec., at the edge of a wood, near Asuncion: very rare.

* The genus *Eurema* (Doub.), = *Hypanartia* (Hübn.) appears to me useless, because inseparable from *Pyrameis*. The species have the same facies, and the same nervation. *Hippomene* cannot, without violence, be severed from *Lethe* on the one side, nor from *Atalanta* on the other.

Junonia Lavinia, Cr. This, and its marked var. *Geneveva*, Cr., both come abundantly from both Paraguay and Corrientes. They affect open places, from Nov. to Mar.

Anartia Jatrophæ, Linn. Seasons, localities, habits, and abundance, as the preceding. A wide-spread species.

A. Amalthea, Linn. The form in which this species* occurs is abundant from Goya to Asuncion, generally on the banks of brooks. Oct. to Feb.

A. Corona, mihi. The 1st and 2nd subcostal nervules both present; springing very close together, both anastomosing with the costal, and both presently arching from it, and lost in the costa: disco-cellulars exactly as in *Jatrophæ*. Above, all the w. brownish black, paler at base, and along inner margin. A broad band of orange, ill-defined, divided by the blackish nervules, runs parallel to, and just within, the margin: two angled bands of white cross the disc.-cell in the fore, and one in the hind w. In the latter the nervules are bordered with pearly white. Beneath, the pattern is as above; but more distinct; the white nerve-borders spread so as to make much of the area white; the orange of the sub.-marg. band is paler; but in the h. w. becomes scarlet at its inner side. Squamation somewhat sparse. Exp. 2.2 inches. The outline of the wings is exactly that of *Jatrophæ*; and, unlike as it appears, the pattern of that species may be traced, especially in the angled bands within the cell of f. w. My friends' *estancia* bears the name of *Corona*, which name I adopt for this rather curious *Anartia*. One example in my cabinet, which was taken near Asuncion, in the open, in Feb. (See fig. 1).

Temenis Laothoe, Cr. Sent, with no note, from Paraguay.

Eunica Maja, Fabr. Taken in all parts of Paraguay, from Oct. to Jan.; in woods, rather scarce.

E. Margarita, Godt. Paraguay. On the banks of a brook near Asuncion; scarce. Nov. to Jan. Corrientes. A single example, taken in April, in a path through the *monte*.

Pyrrhogyra Arge, mihi. This may possibly be only a local

* I do not think this can pretend to claim a *specific* status; but it is a fine and very striking var.; and one which shows no tendency to change in a large number of examples, from all parts. Expanse to above 2.5 inches. Of the six white spots that run across the middle of the front wing (Cram. ccix. A, B.; Doub. & Hew. xxiv. 5), the anterior five are changed into a broad transverse band of white, crossed by the sub-costal and discoidal nervules, as fine black lines. No example with the ordinary facies has occurred.

var. of *P. Tipha*, L., but its facies is so different as to make it quite as worthy of specific designation as many that are so honoured now-a-days. The outline of the wings is quite different; —much broader behind, the hind pair much squarer. The beautiful pearly white area of the upper surface (whence I have chosen its sp. name) occupies fully half of the whole, and has between it and the margin (in the f. w.) two white spots, of which the anterior is the more conspicuous and well-defined; in some specimens, however, there is only a dim trace of this spot, and none of the second. Beneath, there is little difference that is describable. Exp. 2 to 2.5 inches. It seems in some respects intermediate between *Tipha* and *Neærea*, L. Paraguay; at edges of woods; rather plentiful. Sept. to Mar. (See fig. 6).

Eubagis Artemisia, Fabr. Moderately common near Asuncion, about puddles. Dec. to Mar.

Catagramma Sorana, Godt. From Asuncion northward: about puddles. Scarce. This appears to be *C. Zerynthia* of Burmeister (Rep. Arg. Lepid., 173, 511, Atl. v. fig. 9), but not the *C. Latona* of Butler (Lep. Exot. 181, pl. 63, fig. 3). All are grand species!

C. Pyracmon, Godt. Throughout Paraguay. Oct. to March. Plentiful in some parts: frequenting puddles in the open. *C. Hydaspes*, Dru., has not yet been sent me; but it is said to reach to Corrientes.

Hematera Thysbe, D. & H. Near Asuncion in Dec. About puddles: scarce.

Didonis Biblis, Fabr. A few examples taken in April, in a forest-path on the bank of the River Corrientes. In Paraguay it is found throughout; from Sept. to March; always in or near woods, in no great plenty.

Megalura Peleus, Sulz. Near Asuncion, in the open, in Dec.; very rare.

M. Chiron, Fabr. Near Asuncion, and farther north. Affects the vicinity of water: not common.

Heterochroa Iphicla, Linn. Near Asuncion; moderately common, at the edges of woods: Nov. to Feb.

Apatura Agathina, Cr. Sent from Corrientes, and, somewhat more numerous, from Paraguay. In both regions, it is accredited with a proclivity for stagnant puddles and wet mud, like its imperial relative here in England.

A. Varuna, Godt. Paraguay. I have received two examples, both females, taken near Asuncion, in Dec. and Jan., at edges of woods. Very scarce.

Paphia Stheno, Prittw. Woods near Asuncion; Dec. and Jan.: very rare.

P. Glycerium, D. & H. Corrientes, in April. Caught as it played over a water-hole in a path through a wood. Remarkable for a very rapid, and zigzag manner of flight. Near Asuncion it was scarce, in Dec. and Jan., at the edges of woods.

Libythea Carinenta, Cr. Near Asuncion; Nov. to March: quite plentiful at the edges of woods. Later it has occurred also in Corrientes, in the like localities; where my correspondent has specially remarked its rapid, darting flight, and its habit of always choosing a *dead* twig for its resting-place.

MORPHIDÆ.

Morpho Achilles, Linn. Paraguay; from the banks of the Paraná, as far as Asuncion, at least; shady walks in woods: abundant; always of the var. *Achilles* proper.

BRASSOLIDÆ.

Brassolis Sophoræ, Linn. Near Asuncion. One or two examples only, taken in the open, in March.

Dynastor Darius, Fabr. Two examples were sent from Corrientes in March. They are described as appearing only on the approach of evening. Both were females, and, with each, I found, in the inclosing paper, several new-born larvæ; about 0·5" in length, with large globose head, and cylindric body terminating in two divergent processes, each carrying a strong seta. This form is proper to the known larvæ of the family: and, combined with fragments of pearly egg-shells, also in the papers, they show that the butterflies, incompletely killed, laid their eggs in the paper pockets; that these hatched on the voyage, and were starved to death, of course. A tragic history!

SATYRIDÆ.

Taygetis Andromeda, Cr. Scattered sparsely throughout Paraguay. Woods; Sept. to March. Var. *b.* of Mr. Butler's Catalogue.

T. Chelys, Fabr. Taken in Nov. in a wood near Asuncion.

Euptychia Summandosa, mihi. Paraguay throughout; Oct. to Jan. Woods; scarce. Above, pellucid-white, fuscous-edged; not to be distinguished from *Cissia* of Cr. (exciv. D), if we allow for the inferior surface seen through the scant squamation. Below, fuscous, crossed by one white band beyond the cell, from costa of f. w., at one-fourth from point, to anal angle of h. w., narrow at each extremity, but enlarging (abruptly in the f. w., gradually in the h. w.) to the point of overlapping. Ocelli almost obsolete in f. w.; obsolescent in h. w., where 1st, 2nd, and 5th are black-pupilled, 3rd and 4th unpupilled, all in fulvous rings. We have here another imitation, almost exact, of the under surface of the Asiatic *Hesione* group, such as *Mycalesis mandosa*, as figured by Mr. Butler (Cat. D. L.; Sat.; iii. 9).

E. Celmis, Godt. Corrientes; always in high grass. Paraguay. Woods near Asuncion, in Dec.; scarce. The examples agree with Burmeister's "var. pag. sup. a; p. inf. b." (*Op. cit.* 211).

E. Sosybius, Fabr. Paraguay. Sept. to March. Abundant near woods, in all parts.

E. Periphas, Godt.? Paraguay; but not distinguished from the preceding.

ERYCINADÆ.

Notheme Eumeus, Fabr. Paraguay. Near puddles; very rare; March.

Lymnas Melander, Cr. Paraguay. Edges of woods: scarce; Nov. to Feb.

Riodina Lysippus, Linn. Corrientes; many examples, but no notes. Paraguay. Abundant in all parts; Oct. to Feb.; edges of woods.

Emesis Ocypore, Hübn. Corrientes; about bushes at the edge of the monte, or scrub-clad hills. I do not receive this from Paraguay; Hübner ascribes it to Mexico.

Charis Zabua, mihi. Corrientes; March; not uncommon, in open places, destitute of grass, but having scattered low flowering plants. This tiny moth-like butterfly may be thus described. Above, all the wings dull greyish-brown. F. w., basal half crossed by three black bands interrupted by the nervures, of which the third is joined by a very undulate band, inclosing a dark brown patch, at the end of the disc.-cell, and a white spot on the costa. Margin with two rows of black arches, whose points descend into

the deep fringe. H. w. similar in colour and marking, but suffused with a warmer brown, especially on the outer half. Beneath, ground-colour lighter; the bands resolved into defined black spots; each (and markedly each black marginal arch) bounding and inclosing a spot of white. This mode of white speckling characterizes, in some individuals, the upp. surf. also. Expanse 0·8 to 1·15 inch. Name from Heb. *zabua*, "speckled." (Jer. xii. 9). It seems near *Arius*, Cr. pl. xxxi. E. (See fig. 5).

Lasaia Meris, Cr. Paraguay. Dec. to Feb. About puddles; scarce.

Lemonias Campestris, Bates (or very closely allied to this). Paraguay. In the open, near Asuncion. Nov. to Jan.; scarce.

Anatole Glaphyra, Westw. Paraguay: on the banks of a brook near Asuncion, in Nov.: very rare.

Nymphidium Arche, Hew. (or very closely allied to this). Paraguay; near puddles, in January; not common. A single example from Corrientes.

LYCENADÆ.

Thecla Polybe, Linn. Paraguay: Dec. Margins of woods near Asuncion; scarce.

T. Cimelium, mihi. H. w. two-tailed; anal angle produced into a minute point, but with no rounded lobe. F. w. with the shoulder strongly rounded. Above, we see the very counterpart of *T. Polibetes*, Cr. (pl. 341), or, yet more exactly, of *T. Syncellus*. Cr. (pl. 334), save that the black spot in the cell is small, round, and surrounded by a pale ring: the intense blue hue has the same refulgent lustre. Below, it is very different from either: ground warm fuscous; f. w. with three transverse bands of blackish, of which the second dilates in its middle into a broad oval patch: the third is short, and nearly apical. In the h. w. the same bands are recognised, but extending all across, and much more scattered and broken by the copious aspersion of fuscous scales: an undefined angled patch of dull green at the anal angle. What I suppose to be the female has the blue less lustrous, and the black margin much broader, so as, in the f. w. to include, and so destroy, the spot with its ring. Exp. 1·2 inch. Examples male and female are in my cabinet. The name alludes to the gem-like beauty of the male. Paraguay; in woods; Dec. to Feb.: scarce. (See fig. 2).

T. Dolyllas, Cr. Corrientes. Several examples taken in a garden, in March. "A butterfly of rapid flight."

T. Meton, Cr. Paraguay: woods near Asuncion, in Dec.: very rare.

T. Linus, Sulz. Paraguay: woods near Asuncion. Dec. and Jan.: scarce.

T. Simaethis, Dru. Corrientes. In an open sandy spot, with scattered flowers, but no grass. A few examples taken in March and April.

T. Cruenta, mihi. Above, f. w. sooty black, with a very slight reflex of greyish blue toward the base. H. w. sooty black on the outer half, with a few minute scattered azure scales; gradually becoming bright azure on the half occupied by the median nervure and its nervules: abdom. fossa nearly white. Below, all w. light brownish grey, crossed by four bands of dark red; viz. on f. w. a dash across the cell; then one widening in the middle, where it is broken, and (so to say) disjointed, beyond the cell; then a loose and vanishing cloud of red specks; and then a line on the very edge. H. w. much the same, but the first band consists of three, and the second of many, disjointed portions. There is a red spot between the bases of the two tails, and a black-centred red spot on the anal lobe. The thorax is black, and the abdomen white above, both sprinkled with azure scales: these parts are white beneath. Exp. 0·7 inch. This pretty little species my London correspondent marks as *Tmolus Celmus* of Cr., near which it evidently comes; but it is, I think, distinct. It is also near *Th. sanguinalis* of Burmeister (*op. cit.* p. 239), which he describes as *ecaudate*: but mine has the tails of the usual length. Corrientes, on bushes and flowering herbs at the edge of the *monte*. One specimen in April. (See fig. 4).

T. Celmus, Cr. This differs from the preceding. Above, all the w. lustrous deep blue, with a broad outer margin of black, well defined. Below, light grey: f. w. crossed, at half- and three-fourths-length, by two faint darker lines. H. w. with two or three indistinct dusky spots; a red spot between the tails, and one on anal lobe, both black-centred. Exp. 0·7 inch. Paraguay; Dec.; edge of woods; very scarce.

T. Eurytulus, Hübn. Corrientes: plentiful. Paraguay: rather scarce: Dec. and Jan.

T. Beon, Cr. Corrientes: bushes and flowers at the edges of the *monte*, in April. Very scarce.

T. Ivelia, mihi. Anal lobe of the h. w. present, but small: shoulder of f. w. not projected. Area of all wings a rather light and not very lustrous blue, broadly margined with black, except at the overlapping. H. w. somewhat produced behind; and at this part the black margin is interrupted by two white sub-marginal lines. Below, all w. light warm fuscous, crossed by a white line at the end of the cell, and three white macular bands, black-edged inwards, parallel to the margin; the outmost band obsolescent. The h. w. has, besides, a white marginal line, and another white line running along the fringe, at the hinder edge, where also is a black-pupilled and black-browed scarlet eye; anal lobe black, slightly red-edged. Exp. 1.65 inch. Name underived. My only example is, I suspect, a female, and the diagnosis must be considered provisional. Paraguay, edge of a wood on the north bank of the Paraná, in Oct.; scarce. (See fig. 3).

T. Crolus, Cr. Paraguay; taken with the preceding: scarce.

T. Mulucha, Hew. Corrientes: April. On bushes and flowers at edge of *monte*. Paraguay (with no note).

I have a suspicion, which, for want of a larger series of examples, I can neither prove nor disprove,—that *Mulucha*, *Crolus*, and *Celmus*, are but one species.

T. Marsyas, Linn. Corrientes; not uncommon; taken almost exclusively in the forest, amongst the *pinas*, a *Bromelia*, “with horrible horny hooked thorns set in vertical rows, like those of the pine-apple, but much larger and stronger.” Paraguay; at margins of woods. Nov. to Jan.

Lycæna Cassius, Cr. Corrientes: common.

L. Hanno, Stoll. Paraguay, near Asuncion. In open camp; plentiful. Sept. to March.

One or two more *Lycæna* are sent from Paraguay, which I have not identified, but which I will not venture to describe.

EXPLANATION OF PLATE.

Fig. 1. *Anartia Corona*.

„ 2. *Thecla Cimelium*.

„ 3. *Thecla Ivelia*.

Fig. 4. *Thecla Cruenta*.

„ 5. *Charis Zabua*.

„ 6. *Pyrrhogyra Arge*.

NOTES FROM THE NEW FOREST.

By J. JENNER WEIR, F.L.S., F.Z.S.

I VISITED the New Forest on 23rd July, and remained at Brockenhurst until 9th August. Except during the first three days the weather was very wet, and many parts became swamps.

Argynnis Paphia.—This species was, as usual, abundant, but much earlier in its appearance than last year; the first seen in 1879 was on 19th July, but on 23rd of that month this year most of the males were already worn. The variety *Valezina* was out in fair proportion; one was seen perfectly hermaphrodite, the wings on one side being of the normal colour of the male. Charles Gulliver took a very singular hermaphrodite; the two left wings were male, and the right female; but the upper edge of the primary wing on the latter side was of the usual tawny colour, and one-third of the secondary wing was so coloured; so that in one insect both gynandromorphism and dimorphism existed. I do not remember ever to have met with so remarkable a case. I took a female with a greenish spot on each of the lower wings, and one male with a well-defined white spot on each wing, the spots on the lower wings being somewhat greenish. I observed several females depositing their eggs at some distance from the ground under the lichens growing on the trunks of the oaks, and proved the fact by finding the egg; the young must in these cases often have to travel down the stem ten feet or more before they could reach their food, the leaves of *Viola canina*. The appearance yearly of this insect with white spots on the wings is worthy of remark. Last year I was equally fortunate in taking specimens so coloured.

Vanessa Io.—Of this species I saw several with a minute blue spot on the secondary wings between the ocellus and the inner edge of the wing.

Apatura Iris.—This insect has been less rare than usual; a female was taken by myself from a beech tree; Charles Gulliver took six, and I heard of and saw others. One taken by Gulliver had settled on his cottage, and at Lady Cross a fine male was taken from the door-step.

Lithosia quadra.—Last year this insect was confined mostly

to one wood, but this year it appeared to be distributed all over the forest in suitable localities; the females were very much commoner than the males, I should think in the proportion of ten to one. *Liparis monacha* was commoner than usual, the males far less numerous than the females; some unusually dark varieties were taken. *Cleora glabraria* was very common in the larval state; I heard of collectors taking them by the gross. I found a few dozen, but all were destroyed by Ichneumons; they were late larvæ, and I do not doubt that the presence of the parasite retarded their development, thus giving the Ichneumons a better chance, when they assume the perfect state, of finding caterpillars large enough for them to deposit their eggs in.

At sugar almost no insects were seen on some evenings, and the only species taken by myself worth mentioning was one specimen of *Cymatophora oo*.

Mrs. Greathed, of Lady Cross, very kindly presented me with a female of *Odonestis potatoria* of the red colour of the male, with very little of the yellow which usually characterises her sex. I have but once heard of a similar aberration.

I should say that upon the whole it is the worst year for entomologists ever known in the New Forest, many common species being quite absent.

At page 186 of last month's 'Entomologist,' Mr. P. J. Lowry states that he took *Cleora viduaria*. Is he quite sure it was that species? It has not been heard of in the locality for many years. On the same page he states also that he took *Liparis chrysorrhœa*. Is he sure that the insect was not *L. auriflua*?

Pieris napi.—This insect appears in the New Forest to deposit its eggs in *Barbarea præcox*, in very wet places, where the larvæ must be constantly liable to submergence, as must also often be the case when they feed on *Nasturtium officinale*, a favourite food of the species; it appears to have a very different constitution to that of its allies, *P. brassicæ* and *P. rapæ*, which always feed in dry places. All observations on this insect are now invested with great interest, in consequence of Dr. Weisman's experiments. I am engaged in rearing it from the egg.

CALANDRA ORYZÆ AND ITS ASSOCIATES.

By T. R. BILLUPS.

IN a former article upon *Calandra oryzæ* and its associates (Entom. xii. 267) I promised that, at a future date, the contents of a second parcel of corn-refuse received from my friend Mr. Fitch should form the subject of a further note; I now propose as briefly as possible to state the results of a very minute and close examination of the boxes. I was, however, glad to get the parcel into my garden before attempting to open it, as the outside of it was covered with life which had escaped in transit. A more lively consignment the carrier had never had to carry, and all my endeavours to explain to him that our little friends were nothing more than small beetles made no impression; he was quite sure they were too lively to be beetles, so they must be fleas. Our carrier's fleas, however, proved to be *Hypophlæus depressus*, F., an insect Mr. Fitch seems to have met with, but not in any particular abundance previously to this: these insects had made their escape from a box which contained, by weight, exactly six ounces of clean insects without any refuse whatever. This box I exhibited at one of the meetings of the South London Entomological Society, and it contained probably the largest number of living insects ever exhibited before or since at one time; to attempt to count the whole of this living mass would sorely tax my powers of patience and endurance, so I was compelled to take the more systematic way of weighing, and then counting some eight or nine samples, to form a rough estimate of the enormous quantity in our little box. I found that 800 weighed upon an average exactly one grain avoirdupois, so that we had in our box, in round numbers, 2,100,000; this is entirely irrespective of some thousands that had made their escape on transit from Maldon to Peckham. Mr. Fitch told me that on sweeping up this collection for me, the sides of the sacks standing in the granary were literally covered, so that you could scarcely tell the original colour of the sacks. On opening this box there was a strong peculiar acid smell, resembling the fumes given off from the nest of *Formica rufa* when disturbed. But the result of the examination of the contents of the second box was much more interesting, as it contained several Coleoptera unnoticed

by Mr. Fitch, while one is new to our fauna, and another will probably have to be restored to its original place in the British list from which it was expunged by Dr. Sharp. In addition to my list, which numbered eleven species, I have now to add nine, five of which Mr. Fitch does not seem to have met with in his researches, although Dr. Power seems to have come across some of them. The first is the curious and spider-like *Niptus hololeucus*, Fald., covered with its golden pubescence, of which I found four, followed by the rare *Monotoma quadrifoveolata*, Aub., seventeen in number; neither of these seem to have been observed by Mr. Fitch, or their companion *Alphitobius piceus*, Ol. (five). The shining chestnut-brown *Gibbium scotias*, Fab., was represented by two specimens only, while *Ptinus fur*, L., numbered some fourteen. *Tribolium ferrugineum*, Fab., was in large numbers; but of *T. confusum*, the rarer of the two, I only found three specimens, although I took especial pains in hope of finding more. Now follows a species which is neither in Cox's 'Hand-book of Coleoptera' nor Dr. Sharp's 'Catalogue,' and neither Dr. Power nor Mr. Fitch seems to have met with it. This is a small distinct form of *Læmophlæus*. Mr. Waterhouse is of opinion that it can be no other than *L. pusillus*, Schön., of Waterhouse's and Rye's Catalogue, or the *L. minimus* of Stephens, and which he speaks of as occurring in and near London, in warehouses, &c.: it is not improbable that the smallness of this insect caused it to be overlooked by the before-mentioned gentlemen, it not being above half a line in length, and when turned out on paper it for a long time feigns death, so that it might easily be passed over; of this I found about forty specimens, some of which may now be seen in the British Museum Collection.

The last of my coleopterons found on this occasion is the new addition to our fauna, but there seems to be some doubt about its being truly indigenous. This insect appears to have been met with before, but only solitary individuals; and I believe specimens have been in the British Museum Collection for some years, but without any name. Occurring to me as it did, this drew the attention of other coleopterists to it, and, after a careful examination, Mr. C. O. Waterhouse has described it as a new genus and species of heteromerous Coleoptera, under the name of *Latheticus oryzæ*; his description will be found published in the 'Annals and Magazine of Natural History' for February, 1880.

Dr. Power is of opinion that *Latheticus*, being an imported insect, can scarcely be said to be naturalised. This is probable, but in any case it is in a fair way to establish itself in our storehouses, for the number I met with in the small sample from the granaries, sent to me by Mr. Fitch, was over forty. It has also been met with by Mr. V. R. Perkins in a sample of wheat from Croydon, and in other places since. My last coleopteron brings the total number of *Calandra's* associates found by myself to eighteen distinct species, irrespective of *C. granaria* and *C. oryzae*; and with Mr. Fitch I quite think the store is not yet exhausted, and will well repay further labours. As usual, this sample contained a large quantity of *Acaridæ*, as also of various larvæ, probably coleopterous, and some eight or nine specimens of immature Hemiptera; but of hymenopterous parasites I saw none, although I kept the refuse nearly six months.

The following is a complete list of the Coleoptera found:—

<i>Calandra granaria</i> , Linn.	<i>Gibbium scotias</i> , Fab.
<i>C. oryzae</i> , Linn.	<i>Rhizopertha pusilla</i> , Fab.
<i>Trogosita mauritanica</i> , Linn.	<i>Alphitophagus quadripustulatus</i> , Steph.
<i>Læmophlæus ferrugineus</i> , Steph.	<i>Tribolium ferrugineum</i> , Fab.
<i>L. pusillus</i> , Schön.	<i>T. confusum</i> , Duval.
<i>Silvanus surinamensis</i> , Linn.	<i>Latheticus oryzae</i> , C. O. Waterh.
<i>Monotoma quadrioveolata</i> , Aube.	<i>Hypophlæus depressus</i> , Fab.
<i>Typhæa fumata</i> , Linn.	<i>Alphitobius piceus</i> , Oliv.
<i>Ptinus fur</i> , Linn.	<i>Tenebrio molitor</i> , Linn.
<i>Niptus hololeucus</i> , Fald.	<i>T. obscurus</i> , Fab.

4, Swiss Villas, Coplestone Road, Peckham, S.E., August 6, 1880.

INTRODUCTORY PAPERS ON ICHNEUMONIDÆ.

By JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. II.—ICHNEUMONIDÆ (continued).

SECTION 8.—Scutellum pale; abdomen red or red and black.

- A. Abdomen red, basal segment (and rarely the apex) black (females).
 a. Scutellum yellow or yellowish white.

* Two marks before, and lateral margins of, scutellum more or less whitish.

† 2nd abdominal segment not longer than wide.

†† 2nd segment somewhat longer than wide.

14. *rufinus*, 5 lines (*t, s, l*).

10. *lineator*, 6—8 lines (*t, s, l, a*).

** Scutellum without the marks in front.

† Hind tibiæ with a white ring. 106. *albicinctus*, 3—4 lines (*h*).

†† Hind tibiæ without a white ring; femora generally black; tibiæ pale; apex black.

§ Scutellum and marks on thorax yellow.

× Yellow mark before and beneath the wings; hind coxæ beneath nude.

1. *pisorius*, 11—12½ lines (*l*, *a*).

× × Yellow marks beneath the wings only.

123. *expectatorius*, 10½ lines.

§§ Scutellum and other marks white or whitish; hind coxæ pubescent.

× × × Pale line before the wing; supero-medial area of metathorax deeply emarginate at the apex. - 3. *simulatorius*, 9—10 lines (*l*).

× × × × No pale line before the wings; supero-medial area of metathorax truncate at the apex. - 4. *Coqueberti*, 9—10 lines.

b. Scutellum more or less red.

o Red line before the wings; ovipositor ½ the length of the abdomen; tibiæ partly red. - 81. *lanius*, 4—5 lines (*s*).

oo No red line before the wings.

→ Ovipositor slightly projecting; femora red or black, tibiæ red.

100. *castaneus*, 4½—5½ lines (*s*, *l*, *a*).

+ → Ovipositor ½ the length of the abdomen; front tibiæ reddish, scutellum sometimes black. - 82. *albilavatus*, 4½ lines.

B. 2nd and 3rd abdominal segments only, more or less red (females).

Lateral margins of scutellum white, femora and tibiæ red.

26. *scutellator*, 5—6 lines.

C. 1st to 4th abdominal segments red, base of 1st sometimes more or less black (females).

a. Scutellum white; gastrocæli indistinct.

* Scutellum entirely white; post-petiole entirely punctated; tibiæ red.

105. *semirufus*, 3½—4 lines.

** Apex of scutellum only, white; post-petiole strongly punctated, apex smooth; legs red and black varied.

83. *vacillatorius*, 2½—3 lines (*s*, *l*).

b. Scutellum whitish yellow, base red; post-petiole rather smooth; front or all femora red; tibiæ red. 101. *defraudator*, 4 lines.

D. Apical margins of 2nd—4th segments, 6th—7th entirely red; or greater part of abdomen red; basal keels of scutellum white (females).

† Areolet towards the costa narrow. - 16. *ruficaudus*, 7 lines.

†† Areolet towards the costa wide. 10. *lineator*, 6—8 lines (*t*, *s*, *l*, *a*).

A. Hinder tibiæ black with a white ring (males).

106. *albicinctus*, 3—4 lines.

B. Hinder tibiæ without a white ring (males).

a. Abdomen red, 1st segment entirely black, or apex red.

* Basal keels before the scutellum not pale marked.

† Scutellum and marks on thorax yellow. 1. *pisorius*, 11—12½ lines.

†† Scutellum and marks on the thorax white or whitish.

(Supero-medial area as in the females).

† White line before and beneath the wings.

3. *simulatorius*, 9—10 lines (*l*).

†† White line beneath the wings only. 4. *Coqueberti*, 9—10 lines.

** Basal keels before the scutellum marked with white.

10. *lineator*, 6—8 lines (*t*, *s*, *l*, *a*).

- b. Apex of abdomen, or base and apex, black, sometimes the middle segments more or less so.
- § Front coxæ and trochanters entirely white or whitish.
- × Two large white spots on the breast. - 81. *lanius*, 4—5 lines.
- × × Breast without white spots.
- o Scutellum white on the apex; front femora and tibiæ yellow-red, hinder pair darker; apex of tibiæ brownish.
- oo Scutellum whitish yellow; base red, legs pale red.
134. *niveatus*, 2½—3 lines.
101. *defraudator*, 4 lines.
- §§ Front coxæ spotted with white or yellow.
- + Middle area of post-petiole striated; tibiæ partly pale.
- ++ Face entirely whitish yellow. - 51. *piccatorius*, 7 lines.
- ++++ Face with central black mark. 30. *computatorius*, 6—9 lines (*h, s, a*).
- ++ Middle area of post-petiole punctated.
- ∞ Gastrocæli of 2nd abdominal segment obsolete.
83. *vacillatorius*, 3½—4 lines (*l*).
- ∞ ∞ Gastrocæli distinct and small; greater part of legs dark.
96. *derogator*, 4 lines.
- + + + Middle area of post-petiole smooth; gastrocæli occupying nearly the entire base of the 2nd abdominal segment.
102. *exornatus*, 4—6 lines.
- §§§ Front coxæ black, or at the most partly red.
- a. Vertical orbits not marked with white.
- * Middle area of post-petiole aciculate.
- 2nd and 3rd abdominal segments red, or sometimes red maculated.
- † 3rd segment of abdomen subquadrate.
30. *computatorius*, 6—9 lines (*a*).
- †† 3rd segment transverse.
- † Gastrocæli of 2nd segment wide, the space between them slightly narrower or equal to the middle area of the post-petiole.
50. *gracilicornis*, 6—8 lines (*h, s, a*).
- †† Gastrocæli moderate, the space between them rather wider than the middle area of post-petiole.
57. *raptorius*, 3½—5 lines (*h, t*).
- ** Middle area of post-petiole closely punctated.
- Apex of 1st, 2nd—4th, and sometimes part 5th, abdominal segments red, 4th often with a fuscous mark in the centre.
97. *bilunulatus*, 2½—4 lines (*h, t, a, l*).
- *** Middle area of post petiole scabrous.
- § 3rd abdominal segment red. - 115. *cinctorius*, 7 lines.
- §§ 1st—3rd segments red, base of 1st sometimes black.
100. *castaneus*, 4½—5½ lines.
- b. Vertical orbits marked with white.
- * Middle area of post-petiole aciculate.
- Abdomen red, basal segments more or less black, apex red; femora and tibiæ red, apex of hinder dark
- + Basal keels of scutellum and its lateral margins whitish.
- ++ Areolet towards the costa narrow. - 16. *ruficaudus*, 7 lines.
- ++++ Areolet towards the costa wide.
- ∞ 2nd segment not longer than wide. - 14. *rufinus*, 5 lines (*l*).
- ∞ ∞ 2nd segment somewhat longer than wide,

Scutellum with two white apical spots.

10. *lineator*, 6—8 lines (*t*, *s*, *l*, *a*).
 +-+ No pale marks before the scutellum.
 19. *castaneiventris*, $5\frac{1}{2}$ — $8\frac{1}{2}$ lines, (*l*, *a*).
 ** Post-petiole entirely punctated.
 † Gastrocæli scarcely any. 1st—4th abdominal segments and tibiæ red, apex of hinder one black. 105. *semirufus*, $3\frac{1}{2}$ —4 lines.
 †† Gastrocæli small, but tolerably distinct; middle of abdomen, and apex of 1st segment sometimes, red; legs vary; generally a pale line before and beneath the wings
 97. *bilunulatus*, $2\frac{1}{2}$ —4 lines (*h*, *t*, *l*, *a*).

SECTION 9.—Scutellum black, abdomen red or red and black.

- A. Abdomen red, basal segment more or less black (females).
 a. Antennæ white-ringed; greater part of legs black.
 Post-petiole smooth, gastrocæli none.
 * Petiole pitchy. - - - - 126. *gasterator*, 4—5 lines.
 ** 1st segment black, apex sometimes red.
 75. *corusator*, $3\frac{1}{2}$ — $4\frac{1}{2}$ lines.
 B. Middle of abdomen entirely red (females).
 a. Frontal orbits pale; front femora, tibiæ, tarsi, and apex of hind tibiæ red. - - - - 13. *hæsitator*, 4 lines.
 b. Frontal orbits black; legs dark; tibiæ red (*) or obscure red (**).
 * Gastrocæli moderately deeply impressed.
 23. *culpator*, 7—10 lines (*a*).
 ** Gastrocæli scarcely impressed; front femora and tibiæ with whitish marks. - - - - 103. *apricus*, $4\frac{1}{2}$ lines.
 C. Margins of all the segments and legs red.
 129. *maculicornis*, $2\frac{1}{2}$ lines.
 D. 2nd segment red, 3rd—6th more or less marked with black, 7th red or black, legs more or less red or black.
 19. *castaneiventris*, $5\frac{1}{2}$ — $6\frac{1}{2}$ lines (*l*, *a*).
 E. Four basal segments light pitchy red; legs red, hind coxæ faintly spurred. - - - - 138. *picipes*, $2\frac{1}{2}$ lines.
 F. Four basal segments bright red; tibiæ and femora red, apex of hinder one black. - - - - 124. *femorator*, 5 lines.
 A. Antennæ white-ringed, or some of the middle joints marked with white above (males).
 a. Thorax without white marks; middle of abdomen red; legs dark.
 * Face black. - - - - 23. *culpator*, 7—10 lines (*ant*).
 ** Face white. - - - - 82. *albilarvatus*, $4\frac{3}{4}$ —5 lines (*a*).
 b. Thorax with white marks against the wings; margins of all the segments and legs red. - - 129. *maculicornis*, $2\frac{1}{2}$ lines.
 B. Antennæ without white marks in the centre (males).
 a. Face and thorax with white marks.
 * Basal segments of abdomen black; apical ones, femora, tibiæ, and tarsi red. - - - - 131. *melanopyrrhus*, $7\frac{1}{2}$ lines.
 ** 2nd segment and basal angles of 3rd red; legs black, front ones with whitish marks - - - - 103. *apricus*, $4\frac{1}{2}$ lines.
 b. Face and clypeus more or less white; thorax black; base of hind femora and tibiæ red. - - 45. *latrator*, $2\frac{1}{2}$ — $3\frac{1}{2}$ lines (*a*).
 c. Face and thorax without white marks.

- † Basal segment of abdomen black, legs red, hind coxæ fuscous at the base. - - - 109. *abdominator*, $4\frac{1}{2}$ lines.
- †† 2nd and 3rd segments red, 3rd sometimes with a black line (††).
- † Tibiæ sometimes sordid red or piceous.
23. *culpator*, 7—10 lines (*antæ*).
- †† Base and apex of hind femora red; tibiæ red, apex of hinder one black. - - - *vulneratorius*, $3\frac{1}{2}$ —4 lines.
- ††† 2nd—4th segments red; antennæ beneath, base of hind femora and tibiæ, red. - - - 45. *latrator*, $2\frac{1}{2}$ — $3\frac{1}{2}$ lines (*h, s*).
- †††† 2nd—5th segments red, margins of 6th reddish; front tibiæ only pale. - - - 142. *rufator*, 5 lines.

SECTION 10.—Scutellum pale; abdomen with pale spots, or some of the segments marked with, or entirely, yellow; apex of abdomen black.

A. Antennæ with a white ring (females).

a. Abdominal segments 1st—4th, or 5th, with pale lateral spots.
Hind legs black.

* Hinder coxæ without pubescence beneath.

5. *Bohemani*, 8—12 lines.

** Hinder coxæ pubescent beneath. 6. *sugillatorius*, 6—8 lines (*t*).

b. 2nd—3rd, or 4th abdominal segments with lateral white spots, 1st segment quite black. - - - 7. *cyaniventris*, 6 lines.

B. 2nd—13th, or 14th joints of antennæ pale, the rest black (females).
2nd abdominal segment rufo-fulvous, 3rd yellow-edged, 6th nearly all pale yellow; femora and tibiæ reddish yellow.

128. *lautatorius*, 6— $6\frac{1}{2}$ lines.

A. Basal segment only with white lateral spots or a streak (males).

* Anterior coxæ white, as well as sides of scutellum; femora and tibiæ red. - - - 12. *mæstus*, 4 lines.

** Anterior coxæ black, as well as femora.

† Greater part of hind tarsi white. - 86. *leucomelas*, 6— $7\frac{1}{2}$ lines.

†† Hind tarsi fuscous. - - - 113. *bipunctorius*, 7—8 lines.

B. Several of the basal segments with pale lateral spots (males).

Legs black; anterior tibiæ only partly pale.

† Abdomen lanceolate. - - - 7. *cyaniventris*, 6 lines.

†† Abdomen linear (antennæ sometimes white-ringed).

6. *sugillatorius*, 6—8 lines (*t*).

a. 1st—3rd abdominal segments entire margins, 4th—5th lateral margins, white.

Legs black, front tibiæ partly whitish.

24. *multicinctus*, $4\frac{2}{3}$ —6 lines (*a, l*).

b. 1st—4th segments yellow, base of each more or less black.

Legs yellow with black marks. - 33. *xanthorius*, $6\frac{1}{2}$ —8 lines.

c. 1st—3rd segments straw-coloured at their apical margins.

* A straw-coloured spot on the mesosternum; gastrocæli obsolete; post-petiole alutaceous. - 78. *jugatus*, 5—6 lines.

** No pale spot on the mesosternum; post-petiole smooth.

76. *varipes*, 2— $3\frac{1}{2}$ lines.

d. Apical margins of 2nd and 3rd segments pale; post-petiole more or less punctated; hind legs dark.

85. *dumeticola*, 5—6 lines.

- e. 2nd and 3rd segments entirely yellow; hind femora black; tibiæ yellow, apex of hinder one black.
- * 3rd abdominal segment transverse. - 54. *caloscelus*, 5—6 lines.
- ** 3rd segment subquadrate.
- † Margins of cheeks subdilated or reflexed below the base of the mandibles.
- ‡ Apex of clypeus truncated. - 35. *bucculentus*, 6—9 lines (a).
- ‡‡ Apex of clypeus slightly emarginate and depressed. 36. *suspiciosus*, 6—9 lines.
- †† Margin of cheeks not dilated below the base of the mandibles.
- § Frontal orbits marked with yellow.
- × Front coxæ and trochanters black or spotted with yellow. 37. *gracilentus*, 5—6 lines (a).
- × × Front coxæ and trochanters entirely yellow. 40. *inquinatus*, 6½ lines.
- §§ Frontal orbits not marked with yellow; front coxæ black.
- o Mouth, clypeus, and face yellow. - 34. *confusorius*, 6—7 lines.
- oo Sides of face, and sometimes two spots near the upper part yellow. 42. *luctatorius*, 6—8 lines.
- §§§ Vertical orbits as well as mouth, and face yellow; front coxæ, trochanters, and femora black, more or less yellow at the apex (the yellow segments have at times a black triangular spot). - 121. *dissimulator*, 9—10 lines (a).
- f. 2nd and 3rd abdominal segments yellow, more or less marked with black.
- * Hind legs black, tibiæ with a whitish streak towards the base. Apex of 1st, 2nd, and 3rd segments yellow, 2nd with two black dots on the disc. - 112. *binotatus*, 4 lines.
- ** Hind legs, black and yellow variegated.
- † External orbits without pale marks.
- ‡ 3rd abdominal segment with a short basal black band; 3rd segment subquadrate. - 38. *terminatorius*, 6—9 lines.
- ‡‡ 2nd and 3rd segments more or less black at the base; 3rd segment transverse. - 28. *violitorius*, 6—9 lines (a).
- ‡‡‡ 2nd and 3rd segments with a subtriangular dorsal black mark. 41. *bisignatus*, 8 lines.
- †††† 2nd segment pitchy red, basal sides and a transverse line before the margin black; 3rd extreme margin and lateral spot obsoletely stramineo-ferruginous. 51. *piceatorius*, 6 lines.
- †† External orbits pale marked. Abdomen varies from 2nd—3rd segments more or less yellow, or abdomen yellow, apex black, to quite black; gastrocæli none. 75. *coruscator*, 4—6 lines.
- g. 2nd—4th abdominal segments yellow, 4th sometimes marked with black.
- * Femora almost entirely yellow. 48. *primatorius*, 10—11 lines.
- ** Greater part of femora black. 44. *minutorius*, 4—4½ lines.

SECTION 11.—Scutellum pale, apex of abdomen, and most of the middle, spotted with yellow, or with yellow or white bands.

A. Antennæ white-ringed (females).

a. All the segments with pale margins; greater part of legs yellow (*) or orange (**).

*Margins of segments and marks on thorax yellow.

33. *xanthorius*, 5—6½ lines.

** Margins of segments and marks on thorax whitish.

137. *phaleratus*, 3½ lines.

b. 2nd and 3rd segments yellow, orange, or red; 5th, 6th, and 7th with a yellow dorsal spot; tibiæ straw-coloured, apex of hinder one black.

38. *terminatorius*, 6—9 lines.

c. 1st—3rd or 4th segments testaceous at the edges; legs dark.

77. *luteiventris*, 6—8 lines.

A. Antennæ, basal half bright yellow, the rest black (males).

2nd abdominal segment with two yellow spots; 6th and 7th whitish yellow, legs yellow, hind coxæ and trochanters partly, and apex of femora and tibiæ, black.

120. *dimidiatus*, 5½ lines.

B. Antennæ black (males).

a. Abdomen and legs testaceous; petiole and hind coxæ black.

77. *luteiventris*, 6—8 lines.

b. All the abdominal segments with pale edges; legs as in the females.

* Marks on thorax and abdomen yellow.

33. *xanthorius*, 5—6½ lines (*a*).

The last segments of this species are sometimes without the pale margins.

** Marks on thorax and abdomen whitish.

137. *phaleratus*, 3½ lines (*b*).

c. 2nd, 3rd, 6th, and 7th abdominal segments with the entire margins; 4th, the margin interrupted in the middle, yellow; femora, tibiæ, and tarsi orange, apex of hinder black.

32. *vaginatorius*, 5—6 lines.

d. 2nd segment rufo-fulvous; the remaining ones yellow-edged; femora and tibiæ reddish yellow.

128. *lautatorius*, 6—6½ lines.

SECTION 12.—Thorax red, or partly red with pale markings; abdomen bicoloured, or tricoloured.

A. Abdomen red, base black; sometimes the apex brownish.

* Thorax testaceous. 91. *flavatorius*, 7—9 lines, male and female.

** Thorax red, variegated with sulphur and black.

102. *exornatus*, 4—6 lines, female (*a*).

B. Abdomen red, apex black, anus white.

Antennæ with a white ring.

a. Metathorax with more or less red.

107. *erythraus*, 3—4 lines, male and female.

b. Metathorax black.

* Sides of thorax red. 141. *rubedinis*, 4½ lines, female.

** Sides of thorax and breast black.

† Greater part of the head red. 98. *ruficeps*, 4—5 lines, female (*t*).

‡ Head black, face sometimes with a red mark.

vulneratorius, 3½—4 lines, female (*h*, *t*, *s*, *l*, *a*).

C. Abdominal segments 1st and 4th partly, 2nd and 3rd entirely, red, as well as part of mesothorax; scutellum, tibiæ, and tarsi, apex of hinder one, brown. 108. *Walkeri*, 4 lines, female.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA NEAR BIRMINGHAM.—On Sunday, August 22nd, when coming from church, I distinctly saw, in the park here, two *V. Antiope*. They were flying towards some willows which were close by. I went and fetched my net, but unfortunately did not see them again. I have since heard that another has been seen in the neighbourhood, so I hope soon to be able to record the capture of this periodical insect.—SIR ARTHUR SCOTT, Bart.; Great Barr Hall, near Birmingham, August 24, 1880.

VANESSA ANTIOPA AT DULWICH.—News of the reappearance of so rare a butterfly as *Vanessa Antiope* in the neighbourhood of its old locality cannot but be interesting to your readers. Whilst collecting in the neighbourhood of Dulwich, on the 17th instant, I had a clear sight of this fine lepidopteron. To my dismay it retreated over a fence, and on my succeeding in scaling the barrier it was nowhere to be seen.—G. VERNON HUDSON; 1, Busby Place, Camden Road, N.W., August 24, 1880.

VANESSA ANTIOPA AT WIMBLEDON.—Yesterday (August 24th), whilst working up Wimbledon Common, I captured a splendid specimen of *V. Antiope* at rest on *Vaccinium*. The afternoon was warm and cloudy, with a gentle wind blowing.—THOS. HUMBLE RALFE; Shrewsbury Road, Bayswater, W.

VANESSA ANTIOPA AT FOLKESTONE.—I captured *V. Antiope* in the Warren yesterday, August 22nd; I understand it has been seen in other parts.—WILLIAM PURDEY; 115, Sea View Terrace, Folkestone.

ARGYNNIS CLEODOXA.—I captured near this place, last Wednesday, the 11th inst., a very fine and perfect specimen of the variety *Cleodoxa* of *Argynnis Adippe*.—H. W. LAW; The Chase, Ross, Herefordshire, August 13, 1880.

COLIAS EDUSA.—This butterfly may now be seen flying over turnips and stubbles, but not nearly so abundant as it was a few years since. I have not seen the var. *Helice* as yet.—H. REEKS; Thruxton, August 20, 1880.

POLYOMMATUS PHLEAS.—About the middle of July my sister captured the by no means common variety of the above species without the copper-coloured band on the hind wings, having a

red pencil-like mark in lieu thereof.—R. M. SOTHEY; Rozel, Upperton Gardens, Eastbourne, August 19, 1880.

PUPE OF *DEILEPHILA EUPHORBIE* EMITTING SOUND.—I had four pupæ of this insect sent from Germany; all have now produced imagines. It was my practice occasionally to moisten them, and when placing one in water I distinctly heard it hiss; the sound was repeated several times, and resembled that of a snake.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, London, S.E., August 16, 1880.

RARE LEPIDOPTERA COLLECTED IN 1880.—I have again had the good fortune to take *Nola centonalis* in the same locality as in 1879; but although I worked the place very closely indeed for five weeks, could only meet with it most sparingly, and failed entirely to get any eggs. I took one pair *in cop.*, but the female would not oblige me with a single egg. Another of my most interesting captures was *Acidalia ochrata*, and from eggs then obtained have now larvæ feeding. This insect has not yet been bred in this country. During June last I bred, from larvæ collected by myself in Sussex, a few beautiful specimens of *Sesia spheciformis* from alder.—W. H. TUGWELL; 3, Lewisham Road, Greenwich, August 23, 1880.

CALLIMORPHA DOMINULA.—On July 18th, and the following days, the imagines of *Callimorpha dominula* swarmed in hundreds near a small wood on Tenby Common, near Sherborne, Dorsetshire.—CHARLES E. M. INCE; Shepherd's Bush, W.

CAPTURES NEAR YORK.—The present season has been, in this district, the best of any for the last eight or ten years. Amongst the most unusual species taken in the neighbourhood is *Aplecta occulta*. During last week I had the pleasure of capturing a nice series of the light-coloured form at Sandburn Wood, which, as many of your readers know, is some seven miles to the east of the city. In the same neighbourhood, at the same time, I took some eight specimens of *Cidaria immanata*, many beautiful varieties occurring amongst them; also about sixty *Scoparia truncicolalis*, besides several other odd things. In June last I visited Edlington Wood, near Doncaster, and had good sport with *Asthena sylvata*, taking a long and handsome series; with about forty *Melanippe hastata*. One of the latter was a good

variety. At the same time I got two good varieties of *Abraxas ulmata*. During the last fortnight I have taken over one hundred and fifty very fine *Orthosia suspecta*, and, of course, our old friend *Epione respertaria*. This season we cannot work Askham bog, our piece of marsh-land; but Sandburn has well repaid the time spent in working for Lepidoptera. Amongst many others I have taken long and handsome series of *Ellopiæ fasciaria*, *Macaria liturata*, *Triphæna fimbria*; besides *Aplecta herbida*, *Pericallia syringaria*, *Geometra papilionaria*, *Scotosia undulata*; a pair of *Notodonta dictæoides* just out of pupæ on a birch tree; *N. trepida*; two *Sesia culiciformis*, which is rare here; *Lobophora lobulata* and *Eupithecia indigata*, about fifty each. In July I got several very fine *Boarmia roboraria* at Cawood. But the strangest insects I have taken this season were a *Zeuzera Æsculi*, at rest at Sandburn,—I never remember this species occurring in this district before,—and a specimen of *Sirex gigas* at sugar, also at Sandburn. Taking all into consideration, I have had as yet no cause to complain of the season of 1880.—WILLIAM PREST; 13, Holgate Road, York, August 16, 1880.

LATE APPEARANCE OF CYMATOPHORA FLUCTUOSA.—Whilst beating for the larva of *C. fluctuosa* at West Wickham, on the 17th August, I was surprised on finding a fine specimen of the perfect insect of that species in my umbrella. The larva was at the same time full-fed. I also beat, on the same day, larvæ of *Stauropus fagi*, *Notodonta dodonæa*, *N. dromedarius*, *Eurymene dolabraria*, &c.—W. J. HARPER; 66, Mansfield Street, Kingsland Road, London, August 18.

A WEEK'S LARVÆ-BEATING IN THE NEW FOREST.—My brother having just returned from Brockenhurst, a record of his captures might be of interest to some of the readers of the 'Entomologist' having an idea of visiting that locality during the autumn. Although, generally speaking, larvæ were scarce, a few good things fell to his net. *Acronycta alni*, six; five of these were from beech, and one from oak. *Stauropus fagi*, seven; *Diphthera Orion*, about thirty. *Notodonta dodonæa*, *Acronycta leporina* and *Demas coryli* were common, as were also several other species. Perfect insects were very scarce; nevertheless he obtained a fine series of *Cleora glabraria*. *Lithosia quadra* and *Catocala sponsa*, several. Butterflies were all wasted. Sugar produced only a few *Triphæna fimbria* and *C. sponsa*.—ID.

SCOTOSIA VETULATA AT HAMPSTEAD.—On June 2nd, at Hampstead, I found about thirty larvæ of *S. vetulata*. They were then nearly full grown, and in the course of a day or two changed to pupæ, from which, on July 1st, two dozen imagos emerged. I believe that this is a new locality.—P. F. ALEXANDER; Ivy Cottage, Lower Heath, Hampstead.

EMMELESIA UNIFASCIATA TWO YEARS IN PUPA.—In December, 1878, I received, from a London correspondent, half-a-dozen pupæ of *E. unifasciata*. From these one or two moths emerged in August, 1879. Of the remainder, one to my surprise produced a perfect imago in July of this year. Is this at all usual? or is it another evidence of the abnormal character of the weather last year?—CHAS. F. THORNEWILL; The Soho, Burton-on-Trent, August 19, 1880.

[Very little is known about this subject. It is probable that most species of Lepidoptera do, under abnormal circumstances, remain in the pupa state for very long periods. A series of experiments with pupæ ought not to be difficult to conduct, and would be of great interest.—ED.]

CAPTURE OF *TINEA ALBIPUNCTELLA*, &c., AT WITHERSLACK.—I spent four days at the above place, from the 4th to the 8th of August, 1880. The weather only let me have about three hour's collecting each day. By diligent work I took a fair lot of specimens. *Scoparia truncicolalis* in swarms; a *Scoparia* n. s. very distinct. Plenty of *Argyresthia aurulentella* and *Andereggiella*; a few *Sciaphila penziana*, and *Amphysa gerningana* in plenty; one *Asychna profugella*, and a few *Zelleria hepariella*. *Tinea albipunctella* has puzzled me for the last twenty years. During all that time I have taken perhaps a dozen specimens. I was determined to find out more about it, if possible; so I worked about where I took four specimens, and succeeded in taking ten, and ultimately found a few empty cases protruding from fungi on an old stump. It was only the last hours that rewarded my search for so many years. The sticks and stumps that have been broken up in search of this species must have been a big cart-load. Next year I shall bring the old stumps home, and hope to rear some imagos from them.—J. B. HODGKINSON; Preston.

CHRYSOCLISTA BIMACULELLA.—My sister, while at Hastings, was fortunate in taking, about the middle of last month, a

beautiful specimen of this *Tinea*, which Mr. Stainton pronounces to be very rare.—R. M. SOTHEY; Eastbourne, Aug. 19, 1880.

SUGARING AT CROYDON.—Having heard that somewhat poor results have attended this year's sugaring, even in the most favoured localities,—in some cases not a single specimen of the most common species having been met with,—it may not be entirely without interest to some of your readers if I give the results of a few observations made whilst sugaring in a very limited locality, namely, my own garden. Although it is somewhat difficult to write anything new on this subject, still there are sometimes facts worth noting when working limited areas, which are not only interesting to the general naturalist, but also of some practical use to the entomologist in particular. Being desirous of making a list of the number of species of Lepidoptera which could be taken in one season in one small locality, in the neighbourhood of Croydon, I, amongst other things, resorted to sugaring the fruit and other trees in my garden. The area is about a quarter of an acre of ground, well made use of, and containing a considerable number of trees and shrubs. This position is high and very much exposed, both to south-west and also to northerly and easterly winds. The surface soil is very light, and the strata are the sand-beds of the "Oldhaven series." So much for its features. The number of trees usually sugared was seven, *viz.* laburnum, cherry, hawthorn, holly, plum, apple, and pear. I selected a variety of species, as also a variety of positions, in order to note the peculiarities, if any, that might exist with regard to a liking for any particular spot or tree. I also carefully noted the meteorological aspects, the results of which I give. Although I have as yet taken nothing particularly rare, still I have had fairly good sport, and quite sufficient to arrive at data as to positions and weather aspects likely to prove of use hereafter. During four weeks' sugaring in July and August, at the rate of three nights per week, I have met with the following species in the locality above referred to, most of them in considerable numbers:—*Mamestra brassicae*, *M. persicariae*, *Agrotis nigricans*, *Triphæna fimbria*, *Catocala nupta*, *Mania maura*, *Triphæna orbona*, *T. pronuba*, *Cosmia diffinis*, *Euplexia lucipara*, *Hadena oleracea*, *Mania typica*, *Acronycta psi*, *Xylophasia polyodon*, *X. lithoxylea*, and *Dipterygia pinastri*. As regards the state of the weather I have found that what are considered bad nights have

proved unusually good, and *vice versâ*, as the annexed form will show. Eight selected nights, with notes on results:—

1. Wind S. Sultry and close. Very few; only on exposed trees.
2. S.W. Rather damp. Specimens, five trees out of seven (fairly good).
3. S.W. Heavy rain. Very good till rain washed the sugar off.
4. N.W. Windy. Good where the slightest shelter existed.
5. N.W. Calm and dull. Scarcely any.
6. N.E. Rather cold and dry breezes. Good.
7. N.E. Cold drizzle and choppy wind. Best result of any.
8. W. Warm, and moon. Good at first; after, nothing.

By this it will appear that a cold and damp north-east wind was blowing on the most satisfactory night, both as regards species and numbers; whilst a close evening with a south-west wind was not nearly so good. The favourite trees were the plum and holly; but most likely their position was most advantageous, although apparently such was not the case. Exposed positions seemed preferable to confined ones, owing no doubt to the scent being carried by the wind from the former when it could not reach the latter. One disadvantage of a garden is the number of semi-domesticated insects, to say nothing of Mollusca and Crustacea, in the shape of snails, slugs, woodlice, &c., which infest the sugar, to the exclusion of more valued, but more bashful "game." I use the word semi-domesticated, as I have never yet met with such numbers of the above referred to pests in the woods and forests as occur when sugaring on cultivated grounds or gardens. In fact, ants, spiders, snails, woodlice, and such like, seem to be as closely connected with, and benefited by, civilisation as is the ubiquitous sparrow.—EDWARD LOVETT; Holly Mount, Croydon, July 15, 1880.

CLOTHES' MOTHS.—In 'Entomologist,' 1878, p. 212, reference is made to four species of destructive moths, which are respectively described by the English names of clothes', carpet, fur, and hair moths. Three of these *Tineæ*—*vestianella*, *tapetzella*, *pellionella*—are also referred to by Kirby and Spence, who further name *Laverna sarcitella* and *Galleria mellonella*. Is either of these last a synonym of *Tinea crinella*, which is the fourth insect referred to in the 'Entomologist'? A most abundant insect here is the white-headed clothes' moth (*Endrosis fenestrella*). I should like to know if this is identical with either of the moths in the above list, or if it is omitted because less destructive than those named. It would also be helpful to know under what names Stainton

describes *Vestianella*, *Sarcitella*, *Crinella*, and *Mellonella*.—W. MACMILLAN; Castle Cary, Somerset.

[*Endrosis fenestrella*, Stainton's 'Manual,' ii. 359, is known on the Continent as *E. lacteella* of the Vienna Catalogue (Schiffermiller and Denis). This moth must *not*, however, be confounded with *Laverna lacteella*, Steph. ('Manual,' ii. 398)—a very different species. Although Riley mostly uses the Stephensian names, *Laverna sarcitella*, Stephens, is *Endrosis fenestrella*. *T. vestianella*, Stephens and Wood, is *T. rusticella*, Hübner; 'Manual,' ii. 290. *T. crinella*, Treitschke, Duponchel, &c., is *T. biselliella*, Hummel; 'Manual,' ii. 293; also of the late Mr. Healy's life-history at Entom. iv. 194—6. This is *T. destructor* of Stephens. *Mellonella* (the wax moth) is a *Galleria*, and described under that name in the 'Manual' (ii. 164). Linné described the two sexes as distinct species—the male as *cereana*; the female as *mellonella*. Stephens used the former name.—E. A. F.]

EXTRAORDINARY ABUNDANCE OF WASPS IN THE STEWARTRY OF KIRKCUDBRIGHT.—The proverbial oldest inhabitant cannot remember a year when wasps were in such enormous multitudes as they are here this season. I have heard of several places where the nests were so numerous, and their inmates so aggressive, that the haymakers were ignominiously chased from the field. Last week we counted sixteen nests on a measured half acre of meadow hay at Dalscairth. On about one hundred yards of the adjoining public road we counted, on the roadsides, upwards of thirty-five nests. On an avenue of about three hundred yards in length, leading to a gentleman's mansion, upwards of seventy nests were seen, and in and around a walled garden of about three acres in extent nearly forty nests were found. It is positively dangerous to leave the pathways in the copse-woods—nests of *Vespa norvegica* and *V. sylvestris* hang in every thicket, and a very slight disturbance of their household suffices to bring out a swarm of angry warriors. These are fair instances of what this county produces this year in the wasp line. Of the ground-builders, *V. germanica* is the most numerous species; next comes *V. vulgaris*, and *V. rufa* is in limited numbers. In the meantime the wasps may be considered as beneficial to various interests; and we know a large fruit garden, where the trees were badly infested with "mussel-scale," which has been almost entirely cleared off. The industry shown by the wasps in hunting up the few remaining

specimens is most interesting to watch. Aphides even on the beech hedges may be considered as quite destroyed for a season, and Diptera show a most marked diminution in numbers, entirely attributable, in my opinion and in that of several other observers here, to the wasps. In the summer of 1878 we also had the wasps in exceptional numbers; in the summer of 1879—if we can term such a season as last a “summer”—the finding of a wasp's nest was a rare event. Is it possible that the female wasps can have laid dormant since the autumn of 1878 till this spring? I would be very unwilling to believe that so many females were reared last season as would produce such a crop of nests as we find this year. If we have no weather, or other cause that will check their increase, the next few weeks will be disastrous for fruit-growers and bee-keepers. As yet the wasps have refrained from injuring the small fruit, but we can hardly expect that they will be so forbearing when the large fruit ripens. Bee-keepers will require to be on the alert to prevent plundered lives.—ROBT. SERVICE; Corberry Nurseries, Maxwelltown, N.B.

ABUNDANCE OF WASPS AND ICHNEUMONIDÆ.—I have not for many years seen such an abundance of wasps' nests as there is this year. Those that I have destroyed were nests of *Vespa vulgaris* and *V. germanica*, which occur in about equal proportion. I was too late for *V. rufa* and *V. sylvestris*; both are generally common in this neighbourhood. Coleopterists who want the rare *Rhipipiphorus paradoxus* will now find it in the nests of *V. vulgaris*. I noticed one this morning when digging out a nest of that species. As an agriculturist I am glad to see the extraordinary number of Ichneumons. Every plant seems covered with them, searching for larvæ. They will prove a great nuisance to breeders of insects, as three-fourths of the larvæ I have collected were infested.—HENRY REEKS; Thruxton, August 20, 1880.

SOUTH OF SCOTLAND ENTOMOLOGICAL SOCIETY. — We are pleased to see that a society bearing the above title was established at Galashiels last February. This society is, we believe, the only one of its kind existing in Scotland. Its members number about a score, and it has already held one exhibition of specimens relating to Entomology in connection with a horticultural society at Galashiels. We wish the venture every success. All information relating to it may be obtained from the Secretary, Mr. JOHN CLAPPERTON, Bridge Street, Galashiels.—ED.

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ADDITION OF *BRYOPHILA PAR* TO THE BRITISH FAUNA.

BY WILLIAM WARREN.

MORE than twenty years ago I took a pair of a *Bryophila* at Cambridge, which at the time seemed to me to present decided points of difference from *Glandifera*, but both Mr. F. Bond and the late G. R. Crotch, who saw them, referred them to that species as a variety, and I submitted to their decision. I have taken one or two at intervals since; but last year, having captured ten, quite fresh, and observing new points of difference, I sent a pair to Mr. Barrett, who forwarded them to Professor Zeller. The latter, at first, returned them as *Glandifera*, var. *Par*, but has since, Mr. Barrett informs me, agreed with him that they constitute a distinct species. I will therefore now proceed to give, as far as mere description can do it, the main points by which I think the two species may be differentiated.

1st. The lines and markings of *B. glandifera* are much more sharply and distinctly marked than in *B. Par*, which has, so to speak, a more mealy look.

2nd. Though the lines and markings of the two insects are exactly alike, *B. Par* has all the lines starting as *dark spots* on the costa, and a decided dark line at the base of the cilia of both wings, but especially the hinder ones.

3rd. *B. glandifera* retains its green tinge after death, which continues for years if excluded from light. *B. Par*, which, when fresh and alive, is of a much paler green, often with a beautiful pink tinge, fades directly it is killed, or when worn, to a dirty brick-colour.

4th. While *B. Par* has only, as far as I know, been taken, in this country, on old walls at Cambridge, *B. glandifera* is, I believe, a coast species.

Lastly, *B. glandifera* run slightly larger than the nearly allied species.

I may add that a form of *B. glandifera* occurs which has the mealy appearance of *B. Par*, but without the dark costal markings and base of cilia which are always observable in the latter.

These differences may appear but slight, but to any one who sees a row of the two insects, they will, I feel sure, appear sufficient to convince him of their real distinctness. I shall be much obliged to any one who will next summer send me full-fed larvæ of *B. glandifera* from the coast.

Park House, Stubbington, Fareham, Hants, Sept. 16, 1880.

NOTES ON THE LEPIDOPTERA OF NATAL.

By WILLIAM D. GOOCH, C.E.

I HAVE read the article by Mr. A. J. Spiller, as published in the 'Entomologist' of this year, with much attention, as he describes a fauna which is very well known to me, and of which I have had an experience extending over five years; a field which, as he rightly says, has the merit of being very rich in species, many of them of great beauty and interest.

I feel obliged to express my regret, however, that Mr. Spiller, before addressing his paper to so important an organ in the scientific world as the 'Entomologist,' has not placed himself in communication directly with the great authority on all matters rhopaloceros in South Africa, the genial, enthusiastic, and careful Curator of the Cape Town Museum, Mr. Roland Trimen, F.L.S., &c. Had he done so, his paper would have been very much more complete, and "new species" perhaps might be found as already known, described, and appropriately placed, in the numerous papers published from time to time by the indefatigable author of 'Rhopalocera Africæ Australis.' Not that I disclaim any right to a discovery of new species by Mr. Spiller: my own experience proves that to an enterprising and active collector, as Mr. Spiller evidently is, from time to time new species are almost sure to occur, and such may have been Mr. Spiller's

luck; but I am disposed to believe that had he consulted Colonel Bowker—who was in Natal, and who is the father of colonial collectors—he would have been told where most, if not all, of his “new species” had been collected by the “veteran” himself.

As is the case elsewhere, the occurrence of many species is wonderfully local, both in time and place of appearance; and unless the collector happens to drop upon the particular spot at the particular time, the insects may long remain unknown to him. The skippers—*Leucochitonea bicolor* and *L. paradisea*—are good evidences of this local habitat. I have only heard of them occurring at one spot, and there only for a very short period of the year. Again, on the coast of Natal, the occurrence of *Alena Amazoula* is very local, and I believe, as is not uncommon, the insect is not developed freely in certain seasons. Mr. Spiller, in his description of its haunts, is very accurate, and describes practically three spots of a similar character to those which are known to me, where this curious and eccentric little butterfly occurs. Many others are equally liable to be overlooked from their close resemblance to insects of the same genus, or on account of their mimicking other species; a small insect, which Mr. Trimen, in his last series, has named after me, *Neptis “Goochii,”* is a fair example of this, being very similar to *N. Melicerta* and *N. Saclava*, except that on the wing it appears smaller, and feebler in flight; the markings are so similar, till compared, that they might easily be rejected for the better-known insect. I met with it in several places and on several occasions, and feel sure that it is not rare, but has only been overlooked.

The mimetic tendencies of the *Danaidæ* and *Acræidæ*, or the tendency of other tribes to imitate them, are well known and well exemplified in the South African fauna, and this, especially for the first year or two of collecting experience in the Colony, causes a good many things to be overlooked. Mr. Trimen’s very interesting and scientific Paper on the mimetic tendencies of South-African species, in Trans. Ent. Soc. Lond., vol. xxvi., well explains this. I think the mimetic tendencies of *Pseudacræa Boisduvalii* and *P. Tarquinia*—the former mimicking *Acræa Hypatia* or *Zetes*, and the latter *A. Aganice*—has led Mr. Spiller to overlook them on the wing. They both occur freely in the neighbourhood of Verulam,—Mr. Spiller’s collecting neighbourhood,—but, being usually high flyers, have been probably passed over as *Acræidæ*,

out of reach. This I surmise because Mr. Spiller does not make any mention of them in his notice. They are both very handsome and conspicuous insects.

I will now follow Mr. Spiller's remarks, amplifying them as far as I am able by my own personal observations.

PAPILIONIDÆ.

The *Papilionidæ* naturally claim our first attention. Of these the giant *Papilio Menestheus* (or *Ophidocephalus*) taking precedence, both from his beauty and size. I believe that the latter form (*Ophidocephalus*), like many other species, is only a derivative form of a West-African insect; and although I cannot assert it, I believe both the true *Menestheus* and the derived *Ophidocephalus* are present in the Colony. From Mr. Spiller's experience he seems to have been unlucky in meeting with this prize. I have, however, taken it on the wing near Verulam, and also freely in the big "Bush" he speaks of as producing leopards. I know the bush well, but never saw the leopards, and never carried a brace of revolvers. At the summit of a long ridge, in the middle of this bush and not very accessible, was a long open glade where the undergrowth of thorny climbers (asparagus, &c.) were not quite so abundant as in the lower glades. Here I made a collecting station, spending many days from noon to two o'clock in watching the denizens of the bush and taking what seemed worth the while. And here was the first attempt I made to capture *Ophidocephalus*. Like most *Papilios*, he is a great traveller, coursing along at twenty miles an hour, just below the highest boughs of the open trees, perhaps twenty feet high, and out of reach; but I noticed that there were two spots where he had to dip under lower branches in consequence of the glade narrowing, and here came within jumping distance of my seven-foot net. My first attempt led to ruthless destruction of my net, for, having taken up a position, I struck swiftly and with right good will at the next specimen which came past. He escaped with a dive, but my net and nearly myself were inextricably impaled on a thousand thorns of a festoon of liana. It cost me half-an-hour to clear away the wreck, and meanwhile, as if in spite, whilst thus helpless, specimen after specimen dived at me in an interrogative way and "passed on, on the other side." By the time I was at last free I had learnt that, if I cleared the thorny plants away and got my net in order,

I should certainly have fine fun in getting my noble friend. Having rearranged my net, I repaired next day with a bill-hook and a boy to the scene of action, and chopped away everything that prevented a fair sweep; even then I found that it was much "easier said than done"; his double was so quick that after an hour and a half of steady work, in which I had a chance every seven minutes on an average, I only caught one yellow used-up old male, who could not "dodge" so actively as the others, as he had lost the whole of his tails and most of his hind wings. A little more experience in the course of the week secured several perfect specimens, male and female. But I certainly had harder physical work in catching them than I could have ever believed a butterfly would have yielded. Catching bats in the twilight under Banana plants was easy in comparison. Although I caught this half-dozen or more, I did not notice any great diminution in the number of specimens. So I imagine they were fairly plentiful, and, having enough for my cabinet, I left the others to afford future sport, which they always did in fine weather during the summer. Several of my non-entomological friends looking upon butterfly catching as not a very athletic sport, I took them up to "catch" *Ophidocephalus*, and their efforts and want of success established the pursuit upon a more honourable basis in their minds from that time forth. In this bush glade *Papilio Merope* also occurred abundantly. He dodged about sharply over the thick rank grass of the undergrowth, but was very easy to secure, and used to become a ready victim to my friends when they had utterly failed in catching *Ophidocephalus*? (*P. Menestheus*). Mr. Spiller mentions *P. Cenea*, apparently not understanding that it is the accredited female of *P. Merope*, mimicking *Danaïs Echeria*. There are also an ochre and a red var. of the female of *P. Merope*, which are occasionally to be met with. Decaying guavas or oranges under the trees were great attractions for them.

The transformations of neither of these insects are known*; the larva of *Ophidocephalus* would be a great "find," and should be very large. Like *Apatura Iris*, it may feed on the topmost branches of some of the bush trees. I have never seen an *Ophidocephalus* hover as if depositing its eggs, although I have

* There are two important papers on *P. Merope*, by J. P. Mansel Weale and Roland Trimen, in Trans. Ent. Soc. Lond., 1874; and Mr. Gooch will find its transformations figured and described by the former.—W. F. K.

often watched them, to discover, if possible, where I might look for the larva with success.

The two common insects *P. Demoleus* and *P. Nireus* are very abundant, and they may soon be bred by searching the orange-trees for the larvæ, which are fairly abundant in both cases if you happen to hit on a favourite breeding place.

P. Merope, according to Dr. Seaman, who first called my attention to it, is more strongly and deeply barred at one season than the other, the dry weather of winter making lighter imagos than those bred and developed through the hot damp summer. As Mr. Spiller remarks, many of the *Anthocharinæ* are similarly affected, notably the vars. *A. Keiskamma* and *Evarne*, as also several other common species.

The question of the mimicry of the *Danaidæ* by the female *P. Merope* has been fully dealt with by Mr. Trimen in several papers.

Next in order come *P. Antheus* and *P. Policenes*, very closely allied; the former so rare as to have been sometimes considered almost doubtful; the latter common enough, especially immediately after the early rains and the first heats of summer—in November and December, when, as Mr. Spiller says, they can be taken freely, sipping the moisture from damp mud on the margins of rain-pools in the sandy paths near bush, all along the coast; but they become more rare as you reach the higher ground inland. The transparent greenish tint of *P. Policenes*, with its black bars and long delicate tails, make it a very pleasant insect to take and very difficult to get perfect without spoiling the tails. In the summer of 1878—79 the larvæ and imagines of this insect, as well as those of *P. Pylades* and *P. Leonidas*, were collected in considerable numbers at Durban by Colonel Bowker and by Mr. Philip Payne. They occurred on the young shoots from roots of trees that had been cut down in clearing out the bush to make the park near Durban. The transformations were carefully noted, and specimens sent down to Mr. Trimen for description, soon to be forthcoming. The larva of *P. Antheus* must certainly be rare, and is, so far, unknown. That of *P. Leonidas* had already been worked out by Dr. Seaman, of Pine Town, and by myself on the coast. The protective form and colouring of the pupæ and larvæ of all these insects is most perfect. *P. Leonidas* himself is a very hand-

some butterfly, and both sexes resemble *Danaïs Echeria* to a certain extent, being lazy on the wing, except when startled; they may not unfrequently be passed over on that account. *P. Pylades*, of which two very well-marked vars. occur in Natal, is a very handsome butterfly; one var. is nearly identical with the West-African form; the other is considerably divergent both in markings and tint of colouring. It is accustomed to haunt special spots near the food-plant, and generally requires a long net and a jump to get at it. The larva was discovered in 1878—79 at Durban, as before-mentioned, and very many perfect specimens bred from them; but I am not aware whether both varieties occurred, or to what extent if they did so.

Mr. Spiller mentions *P. Zenobius* as amongst his captures; before accepting the record, I should be glad to hear that it has been examined by Mr. Trimen, and reported "the real thing"; and if not, I hope Mr. Spiller will send the specimen to the Cape by a safe hand, to be verified. Till now, *P. Zenobius* has been considered very doubtful.

Three more *Papilios* not mentioned by Mr. Spiller are, *P. Hippocön*,* *P. Euphranor*, and *P. Echerioides*. They occur in the wooded kloofs of the higher districts of Natal, and are not uncommon. Colonel Bowker has worked out the transformations of one of these, but I am not quite sure which. Two of them are reputed female and male forms: one, the female, tailless; the other, male, tailed and allied to *P. Merope* and his ladies in this respect. I have never had an opportunity to work out the life-history of these insects.

(To be continued.)

IDENTIFYING *ACRONYCTA TRIDENS* AND *A. PSI*.

BY THE REV. G. A. SMALLWOOD.

ALL lepidopterists recognise the difficulty of distinguishing these two insects in the imago state, but many give up the task as hopeless. Even so eminent an entomologist as Mr. Stainton declares in his 'Manual' that the moths cannot be separated, though he has no doubt as to their being distinct species. I am not going to make so rash an assertion as that the moths in

* This insect is regarded as one of the female forms of *P. Merope*.—W. F. K.

question can be certainly distinguished, but I should like to draw attention to some points of difference which may assist collectors in naming the "daggers" correctly, and at the same time to draw forth similar remarks from other observers.

I have in my cabinet a series of ten *Acronycta tridens* and twelve *A. psi*, every one of which has been bred by myself from the larva, and most carefully kept separate and labelled. I can therefore say positively that the insects are rightly named, as there is no difficulty in distinguishing the larvæ.

1. What strikes me on the first glance at the two series, side by side, is that *Acronycta tridens*, as compared with *A. psi*, is the smaller and darker of the two. Newman, I am aware, says that *A. tridens* is no darker than *A. psi*; but with due respect to his authority I maintain that the difference of shade is distinct.

2. Looking more closely at the insects I find that there is also a difference in the general colour of the fore wing. In *A. psi* it is pure grey, varying in shade, of course, in different specimens, some being dark grey, others paler; but the grey is pure in all, that is, a mixture of black and white only; whereas in *A. tridens* a third colour, ochreous-brown, is added, so that the general colour is warmer, and of a brown-grey hue. In *A. psi* there are parts of the fore wing (as the inner part of the subterminal line) which are often pure white. In *A. tridens* even the whitest parts are suffused with ochreous, and there is no part pure white.

3. With regard to the markings. All the markings of the fore wing in *A. psi* are more abrupt and defined than in *A. tridens*, whereas in *A. tridens* the markings are blended with the ground colour by the soft brown tint which suffuses the whole wing.

4. There are one or two marks which call for attention in particular. With reference to the †-like mark at the anal angle, this mark is somewhat different in the two species. In both it consists of a longitudinal black dash crossing a diagonal curved black line. Now in *A. psi* the curved line is darker and heavier than in *A. tridens*. Moreover, the longitudinal dash is shorter in *A. tridens* than in *A. psi*. In *A. psi* this straight black dash extends from the fringe through the subterminal line and beyond towards the base; but in *A. tridens* it scarcely passes the subterminal line.

5. The scales on the head and palpi in *Acronycta tridens* are

brown; in *A. psi* grey, or nearly white. This last is, I think, a very tangible point of difference.

6. The hind wing of *A. tridens* presents an obvious sexual difference which I have not hitherto seen noticed. In the female *A. tridens* and in *A. psi*, of both sexes, the hind wing is more or less shaded darker, especially toward the hind margin; but in the male *A. tridens* the whole of the hind wing is pure shining white, and on the white ground the black dots on the hind margin stand out clearly. Not even on the veins is there any dark shading whatever.

I may add that in observing this sexual difference in *A. tridens* I was guided by opening the bodies to prevent grease, putting those down as males which contained no eggs.

The foregoing remarks are offered with the hope of eliciting the observations of other entomologists who may possess specimens of the two species which have been bred by themselves, and as to the correct naming of which there can be no doubt.

Holy Trinity Vicarage, Ashby-de-la-Zouch, Sept. 14, 1880.

THE LARVA OF *PACHETRA LEUCOPHÆA*.

BY GEORGE ELISHA.

OF this hitherto unknown larva I succeeded in rearing three from the egg to the pupa state. Unfortunately they did not emerge, through, I am now convinced, keeping them too dry; in fact, taking too much care of them. I think if they had been left out in the weather they would have done better; however, a few facts concerning them may be interesting, and possibly of use to others, to enable them to arrive at a more satisfactory result.

The eggs from the captured female of *P. leucophæa*, mentioned in the 'Entomologist' (vol. xii., p. 205), hatched in about three weeks; the larvæ escaped by gnawing a hole through the side of the egg, and when first hatched were of a light greenish grey colour, and extremely active. Being in doubt as to what kind of grass they fed on, I went specially to Box Hill and cut out some turfs of grass of nearly every sort I could see, and placed them side by side, so as to make a compact sod of grass in the cage. The larvæ soon crawled out of the pill-box on to the grass, and

kept wandering about without the least inclination to settle down. On looking at them the following morning they were still crawling backwards and forwards over each other in the corner of the cage, and doing anything but eating. I thought there must surely be some mistake in the food, and went at once to Woodford and dug up a number of small roots of various wild plants, and put them in the cage, but all to no purpose; the following day they were still crawling about, and some were hanging in the web at the edge of the cage dead. I again went to Box Hill, and dug out some tufts of grass and several plants from about the ground by the tree on which the moths were taken. On arriving home I put all I had gathered into the cage, and again, on looking at them the following morning, I had the satisfaction to find several larvæ were feeding on one of the grasses I had brought home last, viz., *Poa nemoralis*. Afterwards I found they would as readily eat *P. annua*, which latter being obtainable nearly everywhere, I had no further trouble about their food.

I was looking at them one morning at the end of the first week, watching them feeding, when, to my great surprise, an ant crawled up a blade of grass with a dead larva in its mouth, an achievement for which he very soon paid the penalty of death. I immediately procured a fresh sod of grass, and removed everything from the cage, put in the fresh grass, and carefully shook and searched all the grass and plants that had been in the cage. I found and killed about a dozen ants, which I must have brought home with the grass roots; but they had made short work of my small larvæ, for, after most careful searching, I could only find twenty-nine. Probably many had died before I hit on the right food. Those remaining gradually decreased one or two at a time during the winter, till after hybernation I had only seven remaining, and of these four more died, about one each week, till only three reached the pupa state. Watching them at this time once or twice a day, I removed the dead ones immediately, and have three of these larvæ nicely preserved.

After the first moult the colour is dark greyish green, with three distinct whitish lines along the body, head yellowish grey, spiracles black, with a few slight hairs. At this period of their life they were generally stretched at full length on a blade of grass when at rest, but as they get older they hide during the day among the roots, and come out at night to feed.

Just previous to hybernation the larva is about one inch and a quarter long, moderately plump, tapering towards each end; head dark shining brown, with black spot each side of mouth; body smooth, dark greyish brown, others light brown, dorsal and subdorsal line very conspicuous and whitish; on each segment are four very distinct linear-shaped black marks, one on each side and close to dorsal line, and one on each subdorsal line. Above the spiracular line is a broad stripe of a much darker shade; spiracles black, with slight hairs; and legs light brown. The distinguishing character in these larvæ is the very conspicuous dorsal and subdorsal whitish lines, and the four rows of linear-shaped black marks, which remain from the first moult to the final change.

After hybernation the larvæ feed rather voraciously, and now become of a dark dingy brown colour, and all the lines and markings that were so very plain before are now scarcely discernible. At the beginning of April they spin a slight cocoon mixed with earth on the surface of the ground, close to a root of grass, and change to a dark brown pupa.

122, Shepherdess Walk, City Road, Sept. 18, 1880.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 161.)

Endopisa nigricana, Steph. = *pisana*, Guen., Doub. = *nebritana*, Doub.—The imago is not uncommon, and sometimes very abundant, in hedges adjoining the fields where peas were grown the previous year; and is also to be met with in woods among *Orobus niger* and other vetches. The larva feeds in the pea-pod in July and August.

Stigmonota coniferana, Ratz.—This species, while not uncommon in Scotland, is rare and local in these counties. The imago appears in May and June among Scotch firs, and has been reared from larva feeding on the bark of these trees. It has occurred at Esher and Weybridge.

S. Leplastriana, Curt.—This insect appears restricted to the south-east corner of Kent, where in some seasons it is not uncommon. The imago flies freely in the sunshine in July and

August among sea cabbage (*Brassica oleracea*), in the stems of which the larva feeds.

S. perlepidana, Haw.—Local, but not uncommon where it occurs. The imago appears in May, and flies freely in the afternoon sunshine. The larva feeds on *Orobis tuberosus* and *O. niger*. The species occurs at Darenth; near Strood; at Folkestone; Tilgate Forest, Hastings; and Mr. C. G. Barrett has recorded it as being very common at Haslemere.

S. internana, Guen.—Local. The imago is to be met with in May and June flying among furze bushes, and has occurred near Darenth and Tunbridge Wells; near Guildford, Epsom; and Brighton.

S. composana, Fabr.—This species is double-brooded, the imago appearing in May and again in August, and is common throughout, among different species of clover. The imago flies freely on warm sunny days, and the white under wings of the male render it conspicuous; the female is more readily to be obtained by sweeping the clover heads.

S. flexana, Zell. = *Weirana*, Doug.—Not uncommon among beeches. The imago flies in June, and is to be met with more plentifully in the early morning by sweeping the tips of the boughs. The larva is said to feed between united beech leaves in August and September, and to pupate in a small whitish cocoon in similar situations. It has occurred at Mickleham, Tilgate Forest, near Hastings, &c.

S. nitidana, Fab. = *redimitana*, Guen.—The habits of this species closely resemble those of the preceding, except that it frequents the oak instead of the beech. It is also smaller, commoner, and more generally distributed. The imago appears in June; the larvæ feed between united oak leaves, and the pupæ are to be found enclosed in small neat cocoons between dead leaves in autumn and winter.

S. Trauniana, Schiff.—Scarce and local. The imago appears in July amongst maple (*Acer campestre*), and its capture has been recorded from Plumstead and near Bexley. It has also occurred at Croydon.

S. regiana, Zell.—Generally distributed. The imago appears in June and July among sycamores (*Acer pseudo-platanus*), and is usually to be met with in plenty on walls and palings near these trees. The larva feeds under the bark, and the pupa,

enclosed in a neat white cocoon, is to be found in the same situation.

S. puncticostana, Steph.—Rare and local. It occurs in woods in June and July, and has been captured at Darenth, near Strood, Folkestone; Croydon, West Wickham, Haslemere; Tilgate Forest, and near Lewes.

S. roseticolana, Zell. = *Germanana*, Wilk. non Hub.—Distributed throughout among wild rose, the larva feeding in the hips. The imago appears in June and July, occurring at Darenth, Coombe, near Strood, Folkestone; Richmond, West Wickham, Haslemere; near Lewes and Hastings.

Dicrorampha alpinana, Treit.—Local. The imago appears on the wing in July, and flies freely at dusk, but generally about six feet from the ground. The larva feeds on tansy (*Tanacetum vulgare*). The localities are Charlton, Darenth, Strood; Croydon, Mickleham, Godstone, Haslemere.

D. politana, Hub.—Rather local, but abundant wherever it occurs. The imago appears in June among yarrow (*Achillea millefolium*), and is common on most railway slopes near London, and is also distributed throughout these counties. It flies during the hot sunshine, and also at dusk.

D. Petiverella, Linn.—Abundant everywhere among yarrow. The imago appears in June and July, and its habits are similar to those of the preceding species. The larva feeds in autumn in the roots of yarrow.

D. flavidorsana, Knaggs.—Must be considered as only a variety of *D. Petiverella*.

D. sequana, Hub.—Local, but common where it occurs. The imago appears towards the end of May, flying amongst the ox-eye daisy (*Chrysanthemum leucanthemum*), and is not uncommon near London. It occurs also at Darenth, Folkestone; Croydon, Epsom, Box Hill, Haslemere; Lewes, Hastings, and Eastbourne.

D. plumbana, Scop. = *ulicana*, Gn., Wilk.—Abundant everywhere among the ox-eye daisy. The imago appears in May and June, and there appears to be a second and less common brood in July and August.

D. plumbagana, Treit.—Less common than the preceding species, but generally distributed. The imago appears in May and June among the ox-eye daisy, and is very partial to railway slopes and similar situations.

D. acuminatana, Zell.—This species is nearly, if not quite, restricted to chalky districts. The imago appears in May, and more plentifully again in August and September. Localities are Folkestone, Darenth; Caterham, Mickleham, Box Hill; Lewes, and Brighton.

D. simpliciana, Haw.—Not uncommon wherever its food-plant, mugwort (*Artemisia vulgaris*), occurs, in the roots of which the larva feeds, remaining therein through the winter, and changing to a pupa in the early spring. The roots should be collected in March and April. The imago appears in June, and has occurred at Greenhithe, Charlton, Plumstead, Northfleet, Dover, Margate, Folkestone; Croydon; and Brighton.

D. consortana, Steph.—Local and not common. The imago appears in July and August among ox-eye daisy, in the shoots of which the larva feeds. It has occurred at Charlton, Margate, Dover, Folkestone; Mickleham, Croydon; and Lewes.

Before leaving this group I must refer my reader to the excellent paper of Mr. C. G. Barrett (E. M. M., vol. ix., p. 25, *et seq.*) on the distinguishing characteristics of the imagos of the various species, most of which are by no means easy to distinguish, and with worn or faded specimens the task is entirely hopeless.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THE LEPIDOPTERA OF THE SHETLAND ISLES.—Mr. Meek's collector has returned from Shetland with a remarkably fine lot of the Lepidoptera of those islands. In the next two numbers of the 'Entomologist' it is intended to describe the remarkable forms which occur in Shetland, and also to figure the more striking varieties in two coloured plates.—JOHN T. CARRINGTON.

APATURA IRIS AND VANESSA ANTIOPA NEAR BATTLE.—On August 1st, a fine male specimen of *Apatura Iris* flew across the lawn here. When I first saw it, it was very near the ground, but was soon out of my reach. On the following Sunday, August 8th, I succeeded in capturing a female of the same species near the same spot; she was very much worn. On Friday, the 27th, I saw a beautiful specimen of *Vanessa Antiopa* in this park. I

pursued it for some distance, but it flew over a very high hedge and made its escape.—THOMAS HOWE; Normanhurst Court, Battle, Sussex, September 5, 1880.

VANESSA ANTIOPA AT CAMBRIDGE.—I received a fine specimen of *Vanessa Antiopa* on August 19th, which had been taken about a mile out of Cambridge on the preceding afternoon, close to an apple orchard by the side of the river.—A. E. HUNTER; Beechville, Tunbridge Wells, September 7, 1880.

VANESSA ANTIOPA IN ESSEX.—On August 31st I captured a fair specimen of *Vanessa Antiopa*, flying round an apple tree, which I had sugared, in our garden.—W. G. NASH; Clavering Vicarage, Newport, Essex.

VANESSA ANTIOPA AT TOOTING COMMON.—On September 2nd my brother, while walking on Tooting Common, had the good fortune to capture a fine specimen of *Vanessa Antiopa*. The insect settled on some old sugar marks on an elm tree, and, having his net with him, my brother was enabled to take it easily.—JAMES TEARSE; 14, Ducie Street, Clapham.

VANESSA ANTIOPA NEAR CAMBERWELL.—On Sunday morning, August 29th, whilst taking a stroll about 10.30 a.m., I observed a *Vanessa Antiopa* flying about a baker's shop in the Brixton Road. After making several ineffectual attempts to secure it, and once getting it under my hat, it escaped, and I did not then see it, though I waited about twenty minutes. I returned, however, with my net a quarter of an hour later; and after waiting another ten minutes, it again made its appearance, and I secured it.—PAUL J. LOWREY; 61, Hackford Road, North Brixton, S.W., September 11, 1880.

VANESSA ANTIOPA AT MALVERN.—A rather worn specimen of this rare butterfly was taken this season in a garden, flying over China-asters, by a friend of mine, who has kindly given it to me. This is the second example taken in Malvern, both of which are in my collection.—W. EDWARDS; Abbey Terrace, Great Malvern, Sept. 20, 1880.

VANESSA ANTIOPA AT HENLEY.—A specimen of *Vanessa Antiopa* was captured at Henley-on-Thames, Oxon, by James Wilkins, on September 3rd, 1880.—W. HOLLAND; 71, Bedford Street, Reading, September 20, 1880.

VANESSA ANTIOPA NEAR PONDER'S END.—I beg to record the capture of a splendid large specimen of *Vanessa Antiopa* on August 22nd last. It was taken in a hat, while at rest on a bed of nettles, by a person who was out fishing. The captor also saw another example on the same day. This beautiful insect was exhibited at the East London Entomological Society on September 8th, and has since been added to the collection of Mr. John T. Carrington.—D. PRATT; 398, Mile End Road, London, E., September 20, 1880.

VANESSA ANTIOPA IN NORFOLK.—A fine specimen of *Vanessa Antiopa* was taken near Aylsham, at the end of August, by Mr. George H. Asker; and another (I think it could have been no other butterfly) was seen by two of my friends on Mousehold, close to Norwich. They described it as "a curious butterfly, quite black," which they had seen flying about. This was on September 2nd.—JOHN B. BRIDGMAN.

LYCÆNA BÆTICA NEAR BOGNOR.—On September 12th, while at Aldwick, near Bognor, Sussex, I went into the garden shortly after breakfast. I almost immediately saw a specimen of this rare butterfly at rest on a geranium. Having obtained my net I succeeded in taking it.—HERBERT EDWARD DURHAM; 82, Brook Street, Grosvenor Square, W., September 21, 1880.

VARIETY OF LYCÆNA CORYDON.—While on a visit to Folkestone, last August, I took a female *Lycæna Corydon* in perfect condition, in which a beautiful fawn-colour, or more correctly pale cinereous, replaces the usual very dark brown ground colour.—H. HODGE; 33, Almorah Road, Islington, N., September 15, 1880.

HERMAPHRODITE LYCÆNA ALEXIS.—I captured near this place, on August 21st, an hermaphrodite *L. Alexis*. It was rather worn.—G. T. DEWEY; 11, Tideswell Road, Eastbourne, Sussex, September 18, 1880.

CATOCALA FRAXINI NEAR BARNSELY.—On September 6th I captured a perfect specimen of *Catocala fraxini* at sugar in my own garden.—W. WHITE; Darton House, Barnsley, Yorks., Sept. 21, 1880.

CATOCALA FRAXINI NEAR ABERDEEN.—On the 30th August, and two nights after, a specimen of *C. fraxini* was seen at sugar on the same tree, and just as my friend was about to capture him he went off. I tried again myself, but have failed in seeing it. I

have been successful in capturing some larvæ from the same tree, but cannot tell as yet what they are. In the north here we have to wait patiently to see what a rare larva turns out, for no one seems to know anything about them. Do you think they are those of *C. fraxini*? In the months of July and August sugaring was of no use here; but I am now taking over fifty moths each night since the 4th September. — JOHN MUNDIE; Aberdeen, September 14, 1880.

[The larvæ found by Mr. Mundie are not probably those of *C. fraxini*, which is said to be full-fed in July. Our correspondent will find a good description of the larva of this species at p. 464 of Newman's 'British Moths.'—J. T. C.]

CATOCALA FRAXINI NEAR BRISTOL.—I captured at sugar in Leigh Woods, near Bristol, on September 1st, a specimen of *Catocala fraxini*. It is unfortunately in bad condition, much worn and broken. I was accompanied by a friend, Mr. H. A. Smith; and Mr. J. W. Clarke, of Park Place, Clifton, saw the insect soon after capture.—G. C. GRIFFITHS; 8, Cotham Side, Cotham, Bristol, September 7, 1880.

DEILEPHILA LIVORNICA AT KINGSLAND.—At midday on the 15th September my father had the good fortune to take a specimen of this rare hawk-moth at rest on the pavement in Mansfield Street. It had been evidently lured by the light of the neighbouring shops. Unfortunately it had damaged itself a little. It is now in the collection of Mr. J. A. Clark, of Hackney.—W. J. HARPER; 66, Mansfield Street, Kingsland Road, September 18, 1880.

DEIOPEIA PULCHELLA.—I took a fine specimen of this moth, flying over a fallow field close to the sea, at Rottingdean, on the morning of Tuesday, September 7th.—R. H. TITHERINGTON; Stanley House, Rottingdean, September 11, 1880.

DEIOPEIA PULCHELLA AT DOVER.—I captured a fine female *Deiopeia pulchella* near Dover, on Sunday, September 12th.—W. J. AUSTEN; Radnor Street, Folkestone.

LITHOSIA QUADRA NEAR FOLKESTONE.—I was much surprised to find a female specimen of *Lithosia quadra* one morning this last summer while walking between Folkestone and Sandgate. Mr. Blackall, of the former town, tells me he also took a single specimen some years ago in the same neighbourhood.—J. R. WELLMAN; 219, Elm Park, Brixton Rise, S.W., Sept. 6, 1880.

STAUROPOUS FAGI.—In the autumn of 1879, while out beating for lepidopterous larvæ, I took four of that of *S. fagi*, from which I reared four fine imagines in May of this year. I have again this autumn taken three more larvæ of this species, and hope in due course to have the same good fortune in rearing the perfect insect, these larvæ having gone to pupæ.—D. PRATT; 398, Mile End Road, London, E., September, 1880.

SUCCESSFUL BREEDING OF XYLINA FURCIFERA (CONFORMIS).—Last April a friend kindly sent me twenty eggs of this rare *Noctua* from Glamorganshire. They all hatched April 18th to 19th, almost before its food-plant, alder, was in leaf; in fact could only find half-opened buds. The young larvæ took kindly to them, and fed up freely and well during May. Nineteen went to pupæ by the first week in June. I avoided touching the larvæ when changing them, and always had fresh and clean moss for them to hide away in during the day, for they only fed at night. Two imagines appeared in my breeding cage July 31st, and others at intervals during August, up to September 1st, when the last moth appeared: in all eighteen magnificent specimens.—W. H. TUGWELL; 3, Lewisham Road, Greenwich.

ACRONYCTA ALNI.—A larva of this rare moth was found in Felbrigg Park, near Cromer, on August 31st, feeding on the rhododendron.—W. J. HAY; 13, Park Road, Haverstock Hill, N.W., September 9, 1880.

MICRA OSTRINA.—On September 8th I was fortunate enough to take a fine *M. ostrina* on Dover Cliffs. I was nearly passing it over as a *Crambus*, which it much resembles in its flight. I took it about eleven o'clock in bright sunshine. My capture confirms an old note I have from Mr. Bond, that this insect is double-brooded, though I understand from the Rev. H. Burney that nearly all of the captures known have occurred in June or July. — BATTERSHELL GILL, M.D.; Folkestone, September 23, 1880.

OPORABIA AUTUMNATA AT DUTTON.—On Saturday and Sunday night I went over from here to try what my lamps would do. There were a few *Hydræcia micacea*, *Nonagria fulva*, &c.; but I was amply repaid by getting one female and one male of *Oporabia autumnata*. It is now thirty years since I last took it, and then

at Barron Wood, near Carlisle. At that time the Wood was open to entomologists, and the best locality in Cumberland. What with its destruction by the Midland Railway, and that curse to entomologists, game preservation, what is left of it might as well have been swept away entirely.—J. B. HODGKINSON; 15, Spring Bank, Preston, September 13, 1880.

CABERA ROTUNDARIA AT DUTTON.—When collecting larvæ last September (1879) at the above place, by beating alder, I beat seven specimens of *Cabera rotundaria*; some of them very strongly marked. Plenty of *C. pusaria* put in an appearance. Whether *C. rotundaria* is a variety, or not, I cannot say. Whether or not it is worthy of a name.—Id.

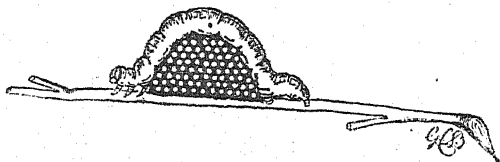
LIPARIS CHRYSORRHŒA AND CLEORA VIDUARIA IN THE NEW FOREST: CORRECTION OF ERROR.—In reply to Mr. Jenner Weir's remarks (Entom. xiii. 207), I may say he is quite correct in both his queries. When I took the pupæ I judged, from the dark colour of the cocoon, that they were *Liparis chrysorrhœa*; but when the moths emerged they proved to be *L. auriflua*. In reference to *Cleora viduaria*, the insect I took was a very late and peculiarly marked specimen of *Tephrosia extersaria*, the white blotch being scarcely apparent, and was pronounced to be in all probability *C. viduaria* by two persons I met collecting. On my arrival home I omitted to look at it more carefully, hence my error. I may also add to my captures, already enumerated, *Zygæna meliloti*.—PAUL J. LOWREY; 61, Hackford Road, North Brixton, S.W., September 11, 1880.

LARVA OF SMERINTHUS POPULI.—A handsome variety of what I believe to be this larva, not described in Stainton's 'Manual' or in Newman's 'History of British Moths,' was found by me on September 1st at Palmerston Park, near Dublin. The larva is ornamented on each side with a double row of ten reddish brown spots. The first five upper spots, counting from the head, are small; 6, 7, 8, large; 9, small; 10, large. The ten lower spots are all much the same size, *i.e.* a little smaller than the large spots of the upper series. When the larva was found the spots were of a brighter (almost marone) colour than they are at present, but they have become duller as the pupa state is fast approaching. The red spot that is always found underneath the horn is present; also a red spot at the bottom of the horn on the

upper side, and another at the top of the head. It has just occurred to me that this larva might perhaps be the child of *S. populi* and *S. ocellatus*; but I should imagine it very improbable that an alliance between the two species would take place in a state of nature. Since writing the above I have seen the description and figure of a larva very similar to mine in Mr. Wilson's 'Larvæ of British Lepidoptera.'—W. W. FLEMING; 18, Upper Fitzwilliam Street, Dublin, September 16, 1880.

ELACHISTA CERUSSELLA.—In the early part of August I collected a quantity of the larvæ of this species, which make conspicuous blotches in the leaves of the reed. There are sometimes two, and occasionally three, in a leaf. The egg is deposited near the tip of the leaf, and the larvæ mine downwards. Out of sixty-one larvæ collected only two escaped the devouring ravages of the Ichneumons; and this is no exception to the rule, having on many previous occasions collected an equal number with a similar result.—WILLIAM MACHIN; 22, Argyle Road, Carlton Square, E., Sept. 10, 1880.

CURIOUS HABIT OF LARVÆ OF THE GENUS BOARMIA.—On June 14th last I received from Mr. G. F. Mathew a larva of *Boarmia repandata*, as figured; and I cannot do better than quote



a portion of his letter:—"I found this larva seated on a twig brooding over the batch of ichneumon cocoons; whether he will move during his journey to you I cannot say, but I carried him many miles in my pocket the day before yesterday and he never budged." When it arrived it was still in the same position, and remained so until I removed it, for preserving, four days afterwards. The imago, about seventy in number, appeared on June 26th. The cocoons beneath the larva are shown as they appeared after the escape of the fly. On August 19th, at 3.30 p.m., while searching for larvæ at Stoke, I saw on a privet bush a moving mass of small larvæ emerging from a larva of *Boarmia rhomboidaria*. I removed the twig, carried it carefully

home, and placed it in a similar position in which I found it, to watch its progress. The larvæ emerged independently (each making a small aperture) from both sides of the caterpillar, which was resting at full length on the upper side, and at once began making a web around the twig and in every direction, apparently without the slightest order; this continued for about three hours before I could detect whether they were going to make a round mass or the usual semi-pyramid of cocoons. From that time it began to get into the final shape, and was completed, to all external appearance, in about seven hours, the mass forming under the twig; the victim by that time had twisted itself half round, apparently trying to protect its destroyers. By the next morning it had taken up a position over the cocoons similar to that figured above. From these observations it will be seen that the caterpillar voluntarily covers them. I am at a loss to conjecture any reason for this, seeing that the larvæ themselves had securely fastened the mass of pupæ to the twig. Ninety-five imagos emerged this morning, which are certainly *Microplitis alvearia*, Fabr., and very distinct from those bred from the *B. repandata*.—G. C. BIGNELL; Stonehouse, Plymouth, September 3, 1880.

[The ichneumon which attacked the *Boarmia repandata* is a species of the genus *Microplitis*, with the head, thorax and abdomen black, all the legs yellowish, except hind coxæ, which are black, but pale just at apex. Such a species is not described by Haliday in 'Entomological Magazine' (vol. ii.).—ED.]

PARASITES OF ABRAXAS GROSSULARIATA.—On the afternoon of May 30th, while standing in a garden at Laira, my attention was directed to a small ichneumon flitting about from leaf to leaf, keeping its antennæ in constant motion, evidently hunting about for a victim in which to perpetuate her race. After waiting and watching some time she came up to the object of her search, which was a larva of *Abraxas grossulariata*. After passing round it several times, apparently to make sure everything was correct, she suddenly sprang on the unfortunate larva, and thrust her ovipositor into the 2nd segment just below the dorsal line; the larva, during the operation, twisted itself from side to side to get rid of the foe. The ichneumon, *Mesochorus olerum*, Curt., then alighted on a leaf close by, and very carefully wiped her ovipositor. I then boxed my lady, and waited to see what the larva would do.

This soon began to move from the leaf, descended the branch, and eventually tried to hide between the stem and the wall (to which the tree was fastened). Seeing it did not intend to make a further start I boxed it, brought it home, and fed it with much care, thinking I should know something of the life-history of *M. olerum*. The larva of the ichneumon became a pupa on June 14th, and the imago appeared on the 29th; but to my surprise out came *Casinaria vidua*, Grav. No doubt that *M. olerum*, who is a hyper-parasite, having found that the *A. grossulariata* was infested with the larva of a *Casinaria*, tried to deposit her egg in the *Casinaria* larva, but by some mishap it did not reach the intended destination. I have bred several *Casinaria vidua* this season from *A. grossulariata*, and two *Mesochorus fulgurans*, Hal. This is a hyper-parasitic species, and I do not think there can be the slightest doubt but that it was a parasite of *C. vidua*. I have arrived at this conclusion from the fact that they came out of *C. vidua* pupæ, and thereby showing that *M. fulgurans* did not complete the entire destruction of *C. vidua* until it had spun its cocoon, which is of an oval shape, and has the appearance of coarse brown paper, the apices brown, followed by a blackish zone; the centre portion, which occupies one-third, is brown. I also bred *Mesochorus sericans*, Curt., which is hyper-parasitic on the larva of the *Tachinidæ*, and, like the above-named species, does not consume its victim until after it has changed into pupa; therefore there cannot be any doubt but that it is hyper-parasitic. I have bred one *Ichneumon trilineatus*, Gmel., to-day; this, after true Ichneumon fashion, did not form a cocoon itself, but emerged from the pupa of *A. grossulariata*. From these larvæ I also bred several dipterous parasites belonging to the *Tachinidæ*; these, Mr. Meade tells me, are all specimens of the variable and common *Exorista vulgaris*, Fall. Last year I bred an undetermined species of *Mesochorus* and an *Apanteles*; the former, without doubt, is hyper-parasitic on the latter, as it emerged from an *Apanteles* cocoon. I have again bred both this year from *Vanessa cardui*. — G. C. BIGNELL; Stonehouse, Plymouth, August 14, 1880.

HARVEST-MEN (TROMBIDIUM PHALANGII). — In a back number of a Natural History Monthly there is an extract from Gosse's 'Tenby,' which refers to "those long-legged cousins of the spiders that are familiarly called harvest-men." Are these creatures really not spiders; and if not, what are they? The long-legged

spiders are unusually abundant here this season.—W. MACMILLAN; Castle Cary, Somerset, August 19, 1880.

[The “long-legged spiders” of our correspondent, as Gosse says, really belong to a younger branch of the spider family, but their hereditary characteristics are better preserved in the harvestmen than in their nearer relations. The Arachnids are divided into three great divisions, which may conveniently be called spiders (*Araneina*), scorpions (*Pedipalpi*), and mites (*Acarina*). The family of the *Phalangidae* includes these “long-legged cousins of the spiders,” and this belongs to the *Pedipalpi*. Their short, but thick, sessile abdomen is distinctly divided into segments, and their maxillary palpi are abnormally developed, both showing their true pedipalp character. The claws of the scorpions are merely a further development of the maxillæ, and this tendency is well shown in our own curious Chelifers, so frequently found amongst old papers. Mr. R. H. Meade’s monograph of the British species of *Phalangidae* appeared in the ‘Annals and Magazine of Natural History’ for June, 1855. Mr. Macmillan gives another instance of the confusion likely to be caused through the use of our popular English names. *Trombidium Phalangii*, Dugés., is that little pest, now so rampant—the bright red harvest-bug. This is one of the *Acarina* named after our pedipalps (*Phalangium spp.*), because the mite, in its six-legged larva state, is frequently found attached to, and feeding on, them.—E. A. F.]

ABUNDANCE OF CRANE-FLIES.—We have not, like some of your correspondents (Entom. xii., 224), been troubled with wasps, but in the West Riding of Yorkshire have had an unusual abundance of crane-flies (*Tipulidæ*). They have swarmed everywhere, the moors and grass-lands being equally overrun with them. I repeatedly had the larvæ brought to me by those who do not ordinarily notice such things, and during the last six weeks the imagos have forced themselves on every one’s notice. It would have been expected that such immense numbers of larvæ would have seriously damaged the grass, corn, and root crops, but fortunately these do not appear to have been at all injured; the hay crops were everywhere heavy, and the corn, &c., have not looked so well for years.—Geo. T. PORRITT; Highroyd House, Huddersfield, Sept. 3, 1880.

ANOMMATUS DUODECIMSTRIATUS, Mull.—I have had the good

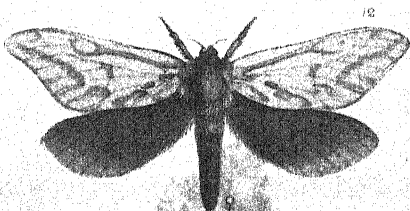
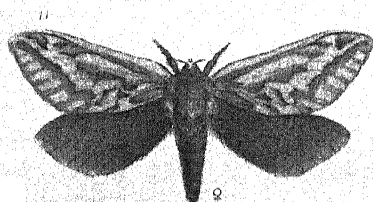
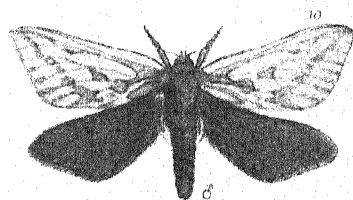
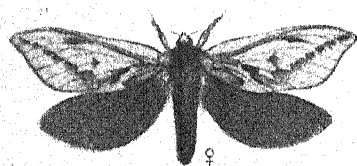
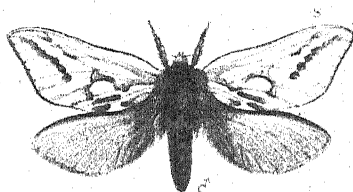
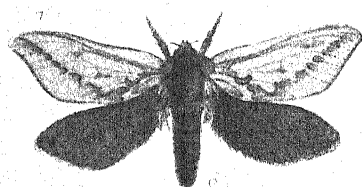
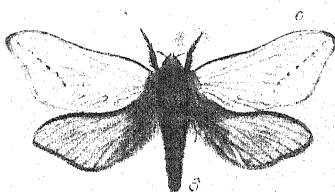
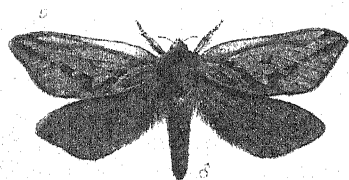
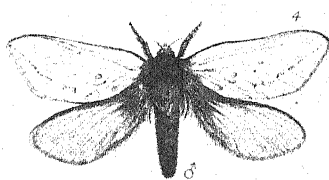
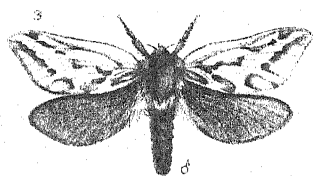
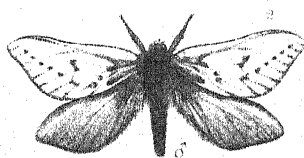
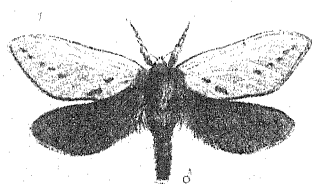
fortune to find three specimens of this beetle on rotten potatoes when digging the crop in my garden.—THOMAS H. HART; Kingsnorth, Kent, Sept. 15, 1880.

ANTHRIBUS ALBINUS, *Lin.*—I have just had the pleasure of setting a specimen of this rare and beautiful weevil. It was taken on the 8th September by my friend, Mr. Jeffrey, crawling on the hat of a gentleman with whom he was botanising a short distance from Ashford.—Id.

NEWSPAPER ENTOMOLOGY.—In reprinting the following cuttings it is unnecessary to comment on the question of the introduction of elementary entomology into schools.—ED. "It is stated that a capture has been made at Stranraer of a Colorado beetle which flew in at a surgery door on Saturday evening. It is said to be about three-quarters of an inch in length. There was a quantity of larvæ on it when caught, and now, two days after, a number of lively little beetles are disporting themselves on potato and cabbage leaves in their glass prison."—'*Daily Telegraph*,' Aug. 17. 1880. *An Enemy to Cotton.*—"The Chief Entomological Commissioner of the United States has, according to a Southern despatch, just addressed the Cotton Exchange at Mobile on the subject of the cotton-worm, now threatening much damage to the growing crop. *The worm, the caterpillar of an owlet moth, is of triangular shape, about an inch long, the upper wings of a reddish gray, and the under wings darker. It has legs; but the foremost are so short that in creeping it arches the back like a span-worm. The colour is green, with light yellow stripes and black dots along the back. It grows often to the length of an inch and a half. Its eggs are ten to fifteen, deposited on the under surface of the tender leaves, which they resemble in colour, and to which they are firmly attached. Incubation lasts from six to fifteen days.*"—'*News of the World*.'

OBITUARY.

HENRY RAMSAY COX.—Our readers will regret to learn that Mr. Henry Ramsay Cox, F.L.S., died at his residence, Forest Hill, on September 3rd, 1880, at the early age of thirty-six years. His name was frequently seen in the pages of this and other magazines.—J. T. C.



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THE MACRO-LEPIDOPTERA OF THE SHETLAND ISLES.

By J. JENNER WILK, F.L.S., F.Z.S.

(WITH A COLOURED PLATE.)

MR. MECK deserves the best thanks of entomologists for his spirited enterprise of sending a collector to these islands, who was there for nearly four months, viz., from the end of April until towards the end of August. I had the opportunity, through the courtesy of Mr. Meek, of inspecting the collection made, and I never saw any contribution to our knowledge of insular entomology so interesting, and, I think I may add, more instructive.

During the collector's four months' residence in the Shetlands twenty-five species of Macro-Lepidoptera were collected, some in tolerable plenty, and others were apparently more rarely met with: this no doubt partially arose from his devoting much time to making what may be deemed almost an exhaustive collection of the astonishing varieties and aberrations of *Heptamelus humuli*, variety *Hethlandica*, Stgr.

The Shetland Isles, excluding the two detached Islands of Foula and Fair Isle, lie between 59° 48' and 60° 52' N. lat., and between 52' and 1° 57' W. long., or between 8° and 9° farther north than London. The isles are more isolated from Scotland than England is from the Continent; Lerwick, the capital, is 171 miles from Wick and 115 from Kirkwall, the capital of the Orkney Isles; between these latter islands and the Shetlands the distance of the nearest headlands, excluding Fair Isle, is about 60 miles. This isolation has produced the usual result. Many of the Lepidoptera differ very materially in colour from those of

Scotland, and still more from those of England, but even more remarkably do some of the insular varieties differ from each other than they do from the type of the species.

I find it difficult to offer any explanation of this fact, but it is possible that the struggle for existence, where so few insectivorous birds and no bats exist, may not be so sharp compared with Great Britain, and the necessity for protective coloration being not so great, a wider range of variation in colour may be consistent with the safety of the species.

The islands are very rocky and barren, quite devoid of trees; some of the higher ground is comparatively lofty, one mountain reaching the height of 1500 feet.

The following species were captured:—

<i>Pyrameis cardui</i> , the only butterfly.	<i>Aplecta occulta</i> .
<i>Hepialus humuli</i> var. <i>Hethlandica</i> , Stgr.	<i>Hadena adusta</i> .
<i>H. velleda</i> .	<i>Anarta melanopa</i> .
<i>Nemeophila plantaginis</i> .	<i>Larentia didymata</i> .
<i>Xylophasia polyodon</i> .	<i>L. cæsiata</i> .
<i>Chæræas graminis</i> .	<i>Emmelesia albulata</i> .
<i>Mamestra furva</i> .	<i>Eupithecia venosata</i> .
<i>Agrotis porphyrea</i> .	<i>E. nanata</i> .
<i>Triphæna pronuba</i> .	<i>Coremia munitata</i> .
<i>Noctua festiva</i> var. <i>conflua</i> .	<i>Camptogramma bilineata</i> .
<i>Pachnobia hyperborea</i> .	<i>Melanippe montanata</i> .
<i>Dianthæcia conspersa</i> .	<i>M. fluctuata</i> .
<i>Dasypolia templi</i> .	

Some of these species present little if any differences from the normal type, and therefore call for no further remark; whilst others are with difficulty recognised as belonging to any known species, and deserve a subspecific name.

Hepialus humuli var. *Hethlandica*, Stgr.—Of this most remarkable insect about one hundred and forty were captured, all of which Mr. Meek kindly showed to me; the variety is very inconstant, and it has been deemed desirable that a plate of the most singular aberrations should be published. The plate contains illustrations of nine males and three females.

Five of the males figured have the dark under wings found generally in the female only; four have the under wings more or less of the usual silvery colour obtaining in the male sex. One undoubted male is coloured almost exactly like a female, the

ground colour yellowish, with darker rufous markings. Most of the males have the upper wings more or less spotted with brown and brownish red, and out of the whole number I found but two of the usual silvery colour of the type both on the upper under wings and thorax.

The range of variation in the females is not nearly so great, and the plate shows the most conspicuous aberrations; these are chiefly in the prevailing ground colour of the upper wings, which varies from brown to yellowish buff, and in two of those figured a very rosy hue pervades the lower wings, particularly in the large specimen at the bottom of the plate. I did not find one instance among the females where the silvery colour usual in the males existed, but some of the very large silvery males, with the thorax buff-coloured, might easily have been mistaken for females. It will therefore be seen that the variations consisted generally in the males being coloured more or less like the normal females. The sexes may be readily distinguished by the existence, in the males, of a tuft of long hair-like scales on the hind legs.

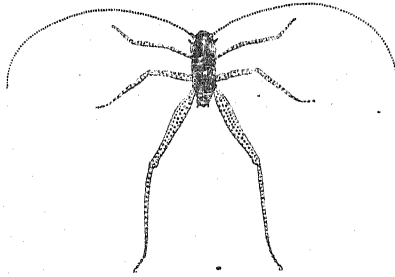
It is possible that in the Shetlands an archaic coloration of *Hepialus humuli* is preserved in those specimens where the sexes are alike and resemble the normal southern female in colour, and that the varieties exhibit the changes which the species is passing through towards a perfect differentiation of sexual coloration; this view is strengthened by the fact that the females are coloured to a great extent like the southern type of the species.

It has also been observed in England that when the males are flying in the well-known vibratory manner, the females fly towards and against them; in the Shetlands, where in summer the nights are so much lighter than with us, it is not so necessary that the males should be conspicuously coloured to enable the females to distinguish them. An examination of the plate shows at a glance how much darker the males are in the Shetlands than in England,—one indeed is quite melanic; on the other hand, the females are rarely darker than in the type of the species.

(To be continued; with Plate of other species.)

INSECTS BRED FROM *CYNIPS KOLLARI* GALLS.

BY EDWARD A. FITCH, F.L.S.



MECONEMA VARIUM.

IN the 'Entomologist' for May of last year my article on the inhabitants of *C. Kollari* galls appeared (Entom. xii. 113). This treated specially of Hymenoptera met with by Mr. Weston while breeding *Ephippiphora obscurana* and other Tortrices. Since that was written Mr. Weston has continued his observations, and bred many more interesting insects: the interest of Messrs. Bignell, Billups, and Howard Vaughan, was also awakened; and from each of these gentlemen I have received a good collection. Others bred from stores of these galls, but their only inhabitants were the usual gall-makers, inquilines, and parasites—the *Cynipidæ* and *Chalcididæ*. Mr. Bridgman, Mr. Carrington, and Dr. Capron bred nothing else; and from three large jars, containing some hundreds of galls, I only bred three specimens of one of the *Ichneumonidæ*, besides the usual inhabitants. My notes have been deferred for the results of another year's working, but in 1879 these galls have been generally scarce, and I have no collections in hand.

At present it is difficult to account for the presence of some of the insects met with, and but little progress has been made in connecting the various parasites with their hosts. When the species are better known I hope this will be attempted by opening the particular gall from which the emergence takes place; circumstantial evidence of the original lodger will probably be forthcoming.

Without further preface I give a list of the species, and include a few remarks which appear to be useful. My former article should also be consulted.

HYMENOPTERA.

Pæcilosoma submuticum, Thoms.—Mr. Bignell bred one specimen of this sawfly in the spring of this year. The larva of the *Emphytidæ* mostly bore into some hollow stem or similar situation in which to pupate; probably the full-fed larva of this *Pæcilosoma* found an old gall handy. Its earlier stages are at present undescribed; it is not even known to be an oak-feeder. The imago is not rare.

Harpiphorus lepidus, Klug.—Mr. Weston bred a specimen in 1878, and another last year. Mr. Bignell bred one on May 20th, 1879; and Mr. Vaughan also bred a single specimen. This last one had the wings much clouded; but Thomson gives the wings as slightly clouded, so I think it can be no other than a variety of *H. lepidus*. This sawfly is figured by André, in his 'Species des Hyménoptères d'Europe' (pl. xvii., fig. 1), now in course of publication.

CYNIPIDÆ.—*Cynips Kollari*, the gall-maker, and the *Synergi*, its inquilines, were bred commonly by all the observers. Mr. Bignell bred one specimen of *C. Kollari* as late as August 15th, from old galls. Of *Synergus*—*S. melanopus*, Hart, *S. Reinhardi*, Mayr., and *S. pallicornis*, Hart., all occurred; the latter being much the rarest.

Fænus jaculator, L.—Three females of this curious insect were bred by Mr. Weston. *F. jaculator* is well known as a parasite of various *Osmiæ* and *Crabronidæ*; indeed its economy was correctly given by Linné, on the authority of Bergman, in his 'Fauna Suecica,' for he says—parasitic on *Heriades truncorum*, *Chelostoma florissomne*, and *Trypoxylon figulus*. Mr. Weston's examples had most probably lived in the larvæ of *Crabro clavipes*; but the *Fænus* is a large parasite for so small a host; its emergence from so small a habitation as *Kollari* gall is alone remarkable. These specimens certainly agree with Tournier's *F. terrestris*, as described in his monograph of the genus *Fænus* (Comptes-rendus, Soc. Ent. Belg., 1877, pp. vi.—x.); but I doubt

whether this author has not mistaken Linné's *F. jaculator*. *F. jaculator* is figured in Westwood's 'Introduction,' fig. 74; 8—16; and by several other authors.

? *Cryptus* sp., *Hemiteles* spp.—In my former article there are some remarks upon three species of Ichneumonidæ, under these headings. Mr. Weston has again met with these interesting species in some abundance, so that a more satisfactory account can now be given of them. I may say that all were led into error two years ago by several of the specimens having their abdomens so compressed in setting that the male genitalia were protruded; these were erroneously taken to be females. Last year many true females were bred, but with the two sexes these interesting species were most puzzling. They were fully examined by Dr. Capron and Mr. Bridgman, on more than one occasion. First, we agreed they belonged to the *Pimplidæ*, and came near *Echthrus* or *Clepticus*; then we thought they might be found amongst the uncertain genera at the end of the *Tryphonidæ*; at last we came back to the old determination, and settled they must be *Cryptidæ*, and come near *Hemiteles*. They proved so puzzling that Mr. Bridgman wrote me: "The species without a perfect areolet might come in *Hemiteles*; if the petiole were more slender they might squeeze into *Atractodes* (*Ophionidæ*), or if the hinder claws were pectinated they might belong to *Phytodietus*; as it is I think they must belong to the cubical-headed *Pimplidæ*." Again he writes: "In going over my collection I came on three little black males, which I tried as everything last winter, and at last left them at the tail of *Phygadeuon*. I am now delighted to recognise them as the males of Weston's genus." Dr. Capron was equally puzzled between a *Cryptid* and *Pimplid* location. Last November I sent thirty specimens (males and females of the two species, and females of the third) to Dr. Kriechbaumer, and he wrote: "Your three species are quite unknown to me, and doubtless they form a most compact genus. They agree pretty well with the *Cryptidæ*, but remind me in many respects (head, antennæ, and structure of metathorax) of the *Xylonomidæ*. Species 2 and 3 Gravenhorst would, I think, have placed with *Hemiteles*. The species also have a great family likeness to *Lissonota*, and may possibly belong to the *Pimplidæ*." He then makes some further detailed remarks, and says, "Shall not you write a short monograph of this interesting genus?" Mr. Bridgman has undertaken this,

and his descriptions and remarks follow this article. The collection was next sent to Herr Brischke, and he named the three species as follows:—“(1) Belongs to *Phygadeuon*, or probably may be *Hemiteles punctatus*, Ratzeburg. (2) Resembles *Hemiteles coriarius*, Taschenberg. (3) Not unlike *Hemiteles monospilus*, but probably new.” Later these were sent to Vollenhoven with the above information, but he did not know them, and quite concurred in their forming a distinct new genus. Had Vollenhoven been spared to complete ‘Pinacographia,’ one or all of the species would probably have been figured in that fine work. I fancy these must be parasitic on the Aculeates, but it may possibly be on the Tortrices.

Phygadeuon obscuripes, Tasch.—Mr. Bridgman tells me that a single female specimen bred by Mr. Billups belongs to this species, which was separated by Taschenberg from Gravenhorst's *P. abominator*. The numerous species of *Hemiteles* and *Phygadeuon* are very puzzling.

Hemiteles oxyphimus, Gr.—A single female, which appears to be a variety of this species, was bred by Mr. Billups. Like most of the *Hemiteles*, it is very probably hyperparasitic; but Ratzeburg says that Wissmann cut many specimens out of oak bark, where it was probably attached to *Anobium*, and Marshall gives it as bred from *Cymatophora ocularis*, a very different history.

H. similis, Gr.—Mr. Billups bred both sexes of this species. It is generally a common parasite in *Microgaster* cocoons, but Mr. Billups also bred it last year from the mines of *Lithocolletis spinicolella*, and Mr. Bridgman from a spider's nest.

H. bicolorinus, Gr.—This pretty species, which has clouded wings like the common *H. areator*, is also hyperparasitic. Also, like *H. areator*, it is commonly bred from the case-bearing larvæ of various Lepidoptera. Mr. Weston bred one female and Mr. Billups three, one a nice variety.

H. arcator, Panz.—Several females again bred by Mr. Weston. See my remarks at Entom xii. 115.

Anomalon geniculatum, Holmgr.—Mr. Weston bred one specimen of a doubtful *Anomalon*, which Mr. Bridgman has, no doubt correctly, determined as *A. geniculatum*; but, he writes, “It differs slightly in the colour of the hind femora from Holmgren's description; still the peculiar arrangement of the posterior discoidal recurrent nervure proves it, I think, to be that species.”

A. geniculatum is new to the British fauna. All the species of *Anomalon* are lepidopterous parasites.

Campoplex pulchripes, Holmgr.—This is another species new to our fauna. Mr. Weston bred one female which either belongs to this species (of which the male only is described), or is new. Most probably it was parasitic on one of the lepidopterous inquilines.

Campoplex n. s.?—Mr. Billups bred a male *Campoplex* which certainly does not belong to one of our British species. In sending to Dr. Kriechbaumer, of Munich, it was destroyed, so there is no hope now of determining this specimen. We hope for more.

Limneria majalis, Gr.—Mr. Weston bred one male which it is at present convenient to call this species. Holmgren separated three species from *majalis* for quite trivial differences, and Brischke has just lately split the old species up into several. This was no doubt correct, but bred specimens were wanted with their biology. We do not yet understand the British specimens sufficiently to follow out these minute details. The present is therefore Gravenhorst's *majalis*, and is, doubtless, a micro-lepidopterous parasite.

L. volubilis, Holmgr.—A new British species, which has been referred to by Mr. Bridgman at Entom. xiii. 53. Mr. Weston bred two males and one female from these galls.

Cremastus interruptor, Gr.—Mr. Weston bred one specimen of this species; it was most probably parasitic on one of the Tortrices. I have lately bred the closely allied *C. infirmus* from two-year-old acorns containing *Carpocapsa splendana*, and *C. interruptor* itself has been commonly bred from *R. Buoliana* (Hartig, Ratzeburg, Bernuth, Wttewaall, &c.). It is also said to have been bred by Reissig from *Gelechia dodecella*, and by Giraud from *Nothris verbascella*, but there are several closely allied species. Ratzeburg figures the female in his 'Die Ichneumonien,' pl. vii., fig. 2.

Mesochorus tetricus, Holmgr.—Mr. Billups bred one specimen of this species, which is new to Britain. The genus *Mesochorus* is a very difficult one, and at present very little understood, especially in this country. However, we are improving, as Dr. Capron (Entom. xiii. 89) took thirteen species last year alone (there are only twenty-six in Marshall's Catalogue, and six of

these are Curtis's and Haliday's species, unacknowledged on the Continent). The species of *Mesochorus* are certainly hyper-parasitic even on different orders, though often apparently bred from Lepidoptera. It is also recorded, and has been observed in this country, that they are external parasites on various insects. See an interesting note on three species of this genus by Mr. Bignell in the last number (Entom. xiii. 245).

Thersilochus saltator, Fab.—Mr. Billups bred two males of this little Ichneumon. Species of *Porizon*, from which *Thersilochus* was separated by Holmgren, are frequently bred from galls; especially *P. harpurus* from the rose bedeguar (gall of *Rhodites rosæ*), and less commonly *P. claviventris* from the oak-galls of *D. scutellaris*. Ratzeburg gives certain species as coleopterous parasites, and Dr. Giraud bred *T. saltator* from *Tischeria angusticollis*.

T. melanarius, Holmgr.—Mr. Billups also bred one female of this small species.

Mesoleius sanguinicollis, Gr.—Mr. Weston bred one specimen. I bred three in July, 1879; curiously this is the only Ichneumon I bred from some hundreds of galls collected in the autumn of 1878. Ratzeburg received the females of this species bred from *Nematus* galls on willows by Herr Brischke, and Vollenhoven saw a specimen emerge from similar galls on sallow. Brischke, in his later work, says "Aus grünen *Nematus*-larven erzogen." Giraud bred it from *Nematus salicis*, but also from his reed insects (*Cemonus unicolor* and *Lipara lucens*), and gives it, but doubtless erroneously, as a parasite of the *Cemonus*. In our case it was probably parasitic, like the other *Mesoleii*, on *Harpiophorus lepidus*; but I have not yet met with the sawfly. This Ichneumon is figured in 'Pinacographia,' plate 23, fig. 6.

M. armillatorius, Gr.—Mr. Weston also bred one specimen of this pretty species. It is known to be parasitic on many *Tenthredinidæ*.

Exochus globulipes, Desv.—This species has not again been bred, but its determination must be corrected. I did not see either of Mr. Weston's specimens until after my paper was published; they were named by the late Mr. F. Smith. I say this because, of course, they were compared with Desvignes' collection, now in the British Museum, and this is another instance of the great muddle in which is our National Collection

of Ichneumonidæ. Mr. Bridgman first pointed out the error, and wrote: "The *Exochus* surely cannot be Desvignes' *globulipes*, because that has an areolet, which this has not." He then gives details of *E. tibialis* and *E. alpinus*, and concludes with "It is a question if such trivial distinctions [the absence of areæ on the metathorax] have any right to be raised into a species." Brischke, who has returned these specimens as *E. tibialis*, Holmgr., without a doubt, says, "*E. tibialis*, Holmgr., female, appears to me to be equal to *E. alpinus*" (Schrift. K. P-o Gesell. Königsberg, xi. 100). The case now stands, therefore, that these two females are *E. alpinus*, Zett., var. *tibialis*, Holmgr.; and if *E. tibialis* be a good species it is British. Vollenhoven's figure ('Pinacog,' pl. 8, fig. 9) of *E. tibialis* leg. cannot be quite correctly coloured.

Ephialtes carbonarius, Christ. ?—Three males and one female, again bred by Mr. Weston, may possibly be referable to this species, but see my remarks at Entom. xii. 116. *E. carbonarius* appears to be attached to the larger wood-boring Longicorn Coleoptera (*Cerambyx*, *Saperda*, &c.), and it is quite possible that Gravenhorst's *E. gracilis* is the *Aculeata* parasite, and a good species. Mr. Bignell also bred one male specimen of an *Ephialtes*. The species with the red prothorax may be *Perithous divinator*, Rossi—a known parasite of *Cemonus*, *Pemphredon*, and *Trypoxylon*.

Clistopyga incitator, Fab.—Mr. Bignell bred one specimen, but Mr. Weston did not again meet with this species.

Lissonota sp? — One specimen bred by Mr. Weston. It appears to be quite unknown as a British species. Mr. Bridgman and Dr. Capron could not determine it, and it is not in the National Collection. Dr. Kriechbaumer returned it as "neither in Gravenhorst, in Holmgren, or in Brischke, and not in our (Munich) collection"; but on subsequently sending it to Herr Brischke it was returned as "either *L. carbonaria* or *melania* of Holmgren." So we must leave it; no doubt it was parasitic on one of the Tortrices.

Spathius rubidus, Rossi. — A small female of this pretty Braconid, bred by Mr. Billups. Both our British *Spathii* are well known as parasites of certain xylophagous Coleoptera (*Anobium*, *Hylesinus*, &c.), and Bargagli bred it from *Phlæotribus oleæ*. Giraud bred *S. rubidus* from *Xiphydria dromedarius* (*Siricidæ*), and named a new species *S. gallarum*, which he bred

from the galls of *C. conglomerata*, which are so very closely allied to *Kollari*. Ratzeburg figures the female of *S. clavatus* ('Die Ichneumoniden,' pl. vii., fig. 10).

Chelonus sulcatus, Jur.—One specimen bred by Mr. Billups. The Chelonides are mostly parasitic on various Tortrices. This species is figured by Jurine, pl. xii., fig. 41.

Ascogaster rufipes, Latr.—Mr. Billups also bred one specimen of this species.

Apanteles sp.?—In 1878 Mr. Weston bred three specimens of an *Apanteles* (Entom. xii. 116); last year Mr. Billups bred one. The specific determination must be left.

Orgilus obscurator, Nees.—This species was described as three by the careful Nees, and Ratzeburg figures it (pl. vii., fig. 9) under Hartig's name of *Macropalpus (Eubadizon) leptcephalus*. Vollenhoven also figures *Orgilus* in 'Pinacographia' (pl. 29, figs. 8 and 9). Ratzeburg and several other writers give this as a common parasite of *Retinia Buoliana*; it is also recorded from a *Depressaria*, a *Gelechia*, and a *Coleophora*. Mr. Weston bred one male from these galls, where it was probably parasitic on *Ephippiphora obscurana*. Walker bred the allied *Therophilus rufipes* from galls both of *C. Kollari* and *A. terminalis*.

Aphidius rosarum, Nees.—Mr. Billups bred an *Aphidius*, which I cannot separate from *A. rosarum*. *Cemonus* and its allies provision their nests with *Aphides*; this probably would account for its occurrence, but Mr. Billups bred no bees.

Microctonus sp.?—Mr. Billups bred a single female which certainly belongs to this genus, but I cannot determine it with any certainty from Haliday's descriptions of *Perilitidæ* in the third volume of the 'Entomological Magazine.'

Perilitus sp.?—Mr. Weston bred a male *Perilitus*; without the other sex it is almost impossible to determine it. The Perilitides, of which Vollenhoven's beautiful plate is just published, are mostly lepidopterous parasites.

Rhizarcha areolaris, Nees.—Mr. Billups bred one specimen of this little *Dacnusa*.

Dacnusa sp.?—One specimen belonging to this genus also bred by Mr. Billups. The *Dacnusidæ* are almost exclusively parasitic in leaf-mining or gall-making Diptera; their presence in these galls must be quite accidental.

CHALCIDIDÆ.—All observers bred these in bewildering

numbers, as might be expected. Mr. Howard Vaughan's collection was very complete. The species commonly met with were *Eurytoma rosæ*, Nees (very common); *Decatoma biguttata*, Swed. (common); *Syntomaspis caudatus*, Nees (uncommon); *Callimome regius*, Nees (very abundant); *Megastigmus dorsalis*, Fabr. (not common); *M. stigmaticus*, Fabr. (common); of *Ormyrus tubulosus*, Fonsc., I bred three females and one male I believe, from these galls, but possibly they might have been from those of *A. Sieboldii*; *Eupelmus urozonus*, Dalm. (not generally common), expressively called "the little cock-tail" by Mr. Vaughan, figured by Haliday (see Entom. vi. 226), and by Dalman; *Pteromalus fasciventris*, Westw. (very common); *P. tibialis*, Westw. (very abundant); also another Pteromalid, which is common, but at present undetermined. In addition Walker bred *Callimome abdominalis*, Boh., and *Decatoma flavicollis*, Wlk. Dr. Mayr bred three males of *Diomorus calcaratus*, Nees, and two specimens of *Eurytoma nodularis*, Boh., from the old galls inhabited by *Stigmus pendulus*, in whose larvæ they are parasitic; but, of course, from the various insects now ascertained to be casual inhabitants of these galls, a very fine collection of *Chalcididæ* might be expected.

Proctotrupes gravidator, Linn.—A fine female of *P. gravidator*, also one of the black species, were bred by Mr. Billups. The *Proctotrupidæ* are mostly parasitic on fungivorous Diptera, and the probable explanation of their presence in these galls is that the imagos found them a convenient hybernaculum. Two plates in 'Pinacographia' (pl. 18 and 19) well illustrate this family.

Megaspilus sp.?—One specimen belonging to this genus was bred by Mr. Billups. Bouché bred a *Megaspilus* from *Syrphus* pupæ, and other species are frequent parasites of *Aphides*. This specimen, doubtless, had a similar origin to the *Aphidius*, also bred by Mr. Billups; but it is impossible to trace it exactly.

Homalus (Hedychrum) auratus, L.—Mr. Weston again bred four specimens of this Chrysid. It must have been reared at the expense of one of the Fossores.

CRABRONIDÆ.—As said in my former article, it is no uncommon thing for *Crabronidæ* to make their nests in these galls after they have been pierced by the exit of the *Cynips* (Entom. xii. 118). Two species were received in Mr. Weston's first collection; these have been again met with, and three others in addition. Mr. Bignell has also bred *Crabro clavipes* in June, 1879. The species

now to be recorded are:—*Rhopalum* (*Crabro*) *clavipes*, L.; three specimens by Mr. Bignell, and four by Mr. Weston. *Stigmus pendulus*, Panz.; five by Mr. Weston. *Passalæcus insignis*, Van d. Lind; six by Mr. Weston. *Cemonus unicolor*, Van d. Lind; one by Mr. Weston. *Psen pallipes*, Panz.; two by Mr. Weston. Mr. Walker bred one *Passalæcus gracilis*, Curt., in May, 1874.

Prosopis rupestris, Smith.—This has not again been met with, but I think it should be recorded that Mr. Bridgman says of it “The *Prosopis* has the same marked face—three bars of white—in the male as *P. communis*, and I think can only be that species.” Mr. Edward Saunders has expressed a similar opinion. When we know that Forster has described ninety-four, and thirteen doubtful, species of *Prosopis* as European, many of which occur in the neighbourhood of Aix-la-Chapelle, it is difficult to believe that our fauna only includes ten species; probably many of the smaller species of these rather obscure bees are still unrecognised in this country. Breeding from old *Kollari* galls may possibly give us an introduction.

LEPIDOPTERA.

The Lepidoptera bred from these galls have already been referred to (Entom. xi. 239, xiii. 91). Mr. Weston has bred *Tortrix viridana*, *Ephippiphora obscurana*, *Coccyx splendidulana*, *C. argyrana*, and *Eupacilia maculosana*. Dr. Gill bred *Eurymene dolabraria*, *Heusimene fimbriana*, *Catoptria Juliana*, *Cryptoblabes bistrigella*, *Ephippiphora obscurana*, *C. splendidulana*, *H. fimbriana*, and *Lemnatophila salicella*; the occurrence of the Geometer is curious, and the life-history of the knot-horn has only lately been made known. In May, 1874, Mr. Walker bred one specimen each of *C. Juliana* and *Dasycera sulphurella*.

DIPTERA.

Two species of Diptera were bred by Mr. Weston. They have been identified by Mr. Meade as follows.

Thryptocera setipennis, Fall.—The female of this species was bred. It belongs to the *Tachinidæ*, a family containing numerous species which are mostly parasitic internally on the larvæ of several orders of insects; a few species have been found in the nests of various bees, especially the Fossores. *T. setipennis* is a species new to Britain, and Mr. Meade has kindly sent me the

following information:—"It is a rather rare and interesting species. Zetterstedt says that it is common in the central and southern parts of Scandinavia, and that the pupæ are sometimes found under moss on trees. Schiner remarks that Boheman has found the pupæ in the body of *Forficula auricularia*. This is all that I can find about the life-history of this parasite, and I do not see how its living upon earwigs will account for its being found in a gall, unless an earwig had taken possession of an old gall with a hole in it, and had died there." This is by no means unlikely.

Anthomyia pluvialis, L. — One female bred. Mr. Meade writes:—"This is often found about the leaves and bark of fruit trees, but nothing is known to me about the food of its larva." Mr. Walker also bred this common species from the common oak-apple (*A. terminalis* galls), and, like many of the *Anthomyiidae*, the larvæ probably live on decaying vegetable matter.

COLEOPTERA.

Olibrus æneus, *O. geminus*, *Dasytes æratus*, *Anaspis maculata*, *Orchestes quercus*, *O. iota*, *Tachyerges salicis*, *Cæliodes quercus*, *Mecinus pyraister*, *Coccinella bipunctata*, *C. variabilis*, and *C. 14-punctata* were all bred, more or less abundantly, by Mr. Weston. The too common *Phyllotreta undulata* occurred to Mr. Bignell in May. These call for no special remarks, as probably all had hibernated in the old galls as imagos, for which they are very convenient. It is these hibernators more than the legitimate inhabitants which are so attractive to the various titmice.

ORTHOPTERA.

Meconema varium, Fabr.—The extraordinary insect figured at the head of this article is the young of this species, probably about two days after leaving the egg. *M. varium* is interesting to British entomologists, as it is our only indigenous locust. Walker, Von Heyden, Hofmann, Rudow, and Mayr have all recorded *M. varium* as a not infrequent inquiline in *A. terminalis* galls. Leopold Fischer, in his great work on the Orthoptera Europæa, says:—"D. de Heyden larvas sæpe numeroque satis magno e gallis Cynipis Quercus terminalis educavit mecumque larvam adhuc mollem, exiguam (1''' langam) benevole communicavit, quæ exeunte majore exclusa erat necdum exuvias mutaverat" (p. 241). This is the only reference I find to the remarkable long-legged,

long-antennæed, spotted creature which is the young of this Locustid. Fischer well figures the imagos, which are generally common in August and September on oak trees, in both sexes, on his plate xii., figs. 19 and 20. In the middle of May of last year Mr. Bignell bred three of these young larvæ from galls collected the previous autumn; hence *M. varium* must hibernate as an egg.

NEUROPTERA.

Elipsocus Westwoodii, M'Lach. — Two Psoci bred by Mr. Bignell (one on 19th May and one on 16th August, 1879) were thus named for me by Mr. M'Lachlan, who adds, "The neuriation of the specimen on the oblong card is in an abnormal condition on the right anterior wing; this and the different setting made it appear a separate species." In 1872 I bred some eight or ten *Psocidæ* from these and *terminalis* galls which I sent to Mr. Walker, who also had bred several examples. Mr. M'Lachlan suggests that they enter the old pierced galls as larvæ to feed on the vegetable débris. This is most probable, as Mr. Bignell had kept the galls from which the last specimen was bred very nearly a twelvemonth.

Hemerobius subnebulosus, Steph.—In the spring of this year Mr. Bignell bred two specimens of this *Hemerobius* from the old galls; they were identified by Mr. M'Lachlan. This appears to be the same species that Mr. Walker bred in April, 1874, from galls collected in the autumn of 1873. The *Hemerobiidæ* are well known Aphis-devourers in the larva state, so it is probable that the galls are only used as convenient shelter for their cocoons.

Maldon, Essex, August, 1880.

THREE NEW ICHNEUMONS.

By JOHN B. BRIDGMAN.

THE three species of *Ichneumonidæ* now described apparently belong to the same group, and notwithstanding their general Pimplid look may fairly be placed between *Phygadeuon* and *Hemitetes*; but for their affinities see the article on the gall-bred insects by Mr. Fitch. They are all, I believe, undescribed, so a specific description is given of each and of the general characters

of the genus, although possibly the red-banded species may not exactly belong to it. It is, however, impossible to deal exhaustively with the group until the genus *Hemiteles* has undergone a similar revision to that of *Cryptus* and *Phygadeuon* at the hands of Thomson.

Hemiteles monospilus, described by Gravenhorst and Taschenberg, is very much like the red-banded species in colour and size, but the description of the metathorax is very different from our insect. Taschenberg places it in a division having "the metathorax elongated, without complete areæ, the back part very oblique, almost confused with the upper part." In our species the two parts are of equal length and at almost right angles.

CECIDONOMUS, nov. gen.

Head more or less globose; antennæ filiform, shorter than abdomen. Width between the eyes and base of mandibles equal to width of base of mandibles. Thorax a little longer than high; legs moderately slender; wings with or without areolet, if present then pentagonal; posterior inferior angle of prædiscoïdal cell, acute; metathorax with five more or less distinct areæ, the supero-medial more or less subpentagonal; thorax alutaceous.

Abdomen subpetiolated, depressed somewhat, apex more or less compressed, 1st segment gradually tapering, with tubercles; aculeus about as long as the abdomen; abdomen about as long as the head and thorax and about as wide as the thorax, the widest part being at the apex of the 2nd segment.

Cecidonomus Westoni, n. sp.

Length 4—6 mill., female. Black; head, thorax, and abdomen black, legs red, apex of intermediate sometimes deeper; apex of hinder femora, tarsi, and tibiæ fuscous; this latter base and middle paler-banded.

Head and thorax coarsely alutaceous, abdomen coarsely and closely punctured, punctures running into each other; metathorax coarsely wrinkled, areæ distinct, supero-medial pentagonal with the lower sides shorter than the upper ones; areolet of wings pentagonal, transverse anal nervure divided below the centre; antennæ about two-thirds the length of the body; aculeus a little longer than the abdomen. Male differs only in having the front

and intermediate coxæ fuscous, more or less pale at the apex, and the hinder ones black.

Fifteen males and nine females bred by Mr. Weston from galls, 1878—9.

Cecidonomus gallicola, n. sp.

Length 4—6 mill., female. Black; legs red, coxæ and trochanters black, apex of hind tibiæ and tarsi sometimes fuscous.

Head and thorax finely alutaceous, first three segments finely alutaceo-punctated, rather more coarsely marked than the thorax, the remaining segment glabrous; areæ of metathorax not so distinct as in the former species, and in form an irregular hexagon, broader than long, narrower in front than behind in the female, more regular, about as broad as long in the male; wings with no areolet, transverse anal nervure divided in or just below the centre; antennæ about two-thirds the length of the body; aculeus a little longer than the abdomen. Male like the female, but has the front and intermediate coxæ fuscous at the base, the hinder entirely so; trochanters red, except the base of the hinder ones.

The finer sculpture, shining apex of the abdomen (and dark coxæ and trochanters in the female), readily distinguish this species.

Two males and four females bred by Mr. Weston from galls, 1878—9. I have taken three males at Norwich.

Cecidonomus? rufus, n. sp.

Length 4—5 mill., female. Black; 2nd and base of 3rd segment of abdomen and legs red, the apex of intermediate and posterior tibiæ and tarsi more or less fuscous.

Head and thorax finely alutaceous; abdomen densely and finely punctured on the 1st segment running into each other; antennæ about two-thirds the length of the body. Wings without areolet, transverse anal nervure broken below the centre; areæ of metathorax distinct, supero-medial varies from a blunt-ended pentagon to a blunt-ended hexagon, about as broad as long, the lower side areæ being shorter than upper ones; aculeus as long as the abdomen and distinctly curved downwards.

Two females bred by Mr. Weston from galls in 1878, and one in 1879. I have also taken two females near Norwich.

Erratum.—Page 261, under LEPIDOPTERA. *Heusimene fimbriana*, *Catoptria Juliana*, should come after *C. argyrana* in the previous line, among the species bred by Mr. Weston.

INTRODUCTORY PAPERS ON LEPIDOPTERA.

By W. F. KIRBY.

No. XVI. NYMPHALIDÆ—NYMPHALINÆ.

(HYPOLIMNAS.)

Few genera of *Nymphalidæ* are more interesting than *Hypolimnas* and its allies, which are almost exclusively confined to the East Indies and Africa. They are insects of considerable size, expanding three or four inches, with more or less dentated wings, and the prevailing colour is generally brown and white, varied with blue. Several species mimic *Danaïnae* to a most remarkable extent.

H. Misippus, Linn., is found throughout tropical Asia and Africa, and is also met with (though probably introduced) in Trinidad, and in several localities on the north coast of South America. It is of a rich dark brown, with a large white spot, shading into blue on the edges, in the middle of each wing. On the under side of the hind wings is a broad whitish band, filling up the central third of the wing. The female is so exact a counterpart of *Danaus Chrysippus*, Linn., that the only difference which strikes the eye at first sight is the presence of one black spot instead of four in the centre of the hind wings. There is a rarer variety of the female (*Inaria*, Cram.), in which the white band at the tip of the fore wings is absent, thus giving it a striking, though less strongly marked, resemblance to *D. Dorippus*.

The next species is *D. Bolina*, Linn. The male is very similar to that of *Misippus*, but the white band on the under side of the hind wings is much narrower and duller, and the large spots above are more blue than white; there is also a sub-marginal row of small whitish spots round all the wings. The female is a large dark brown butterfly, and varies very much; the wings are frequently marked with masses of orange or white, and the hind wings are often bordered with dull white. Only long-continued observations on its range and transformations will inform us whether this is really a polymorphic species, in which the males are very similar, while the females vary greatly; or whether it consists of a cluster of closely-allied species. I do

not think that we have sufficient data to decide the question at present. *D. Bolina* is met with throughout the East Indies and the Eastern Islands.

Of the remaining Eastern species I may mention *H. Alimena*, a brown butterfly about three inches across the wings, with sub-marginal white spots, and a blue band within; and *H. Pandarus*, a considerably larger insect, with brown fore wings, with a sub-marginal row of bluish white dots, and a broad pale blue band across the middle of the hind wings, followed by a row of bluish spots surrounded with black, and bordered outside and at the anal angle with orange. In the female there is a broad transverse buff band on the fore wings, followed by a row of white spots, and white connected crescents nearer the hind margin; the hind wings are reddish orange from the centre nearly to the hind margin, on which is placed a series of rather large oval black eyes with bluish white pupils. This splendid insect, one of the largest of the *Nymphalidæ* (expanding four inches in the male and five in the female), is met with in Amboina and Ceram, but is represented by smaller allied forms in most of the neighbouring islands. *H. Anomala* and its allies are Indian or Malay species (brown, with a marginal row of pale spots), which are chiefly remarkable for their striking resemblance to some of the more obscure species of *Euplœa*.

Hypolimnas is represented in Africa by several handsome species, of which I will only mention two:—*H. Salmacis*, a fine insect, measuring four inches across, brownish black, broadly banded with blue and white, which is common in many parts of the country; and *H. Dexithea*, a species of equal size, found in Madagascar, which has black fore wings, with a broad transverse white band, and white spots near the tip; the hind wings are white, bordered with red in the middle and black at the base; the hind margin is also black, with bluish white festoons; on the under surface the black markings are entirely replaced with red, except a broad band on the inner margin of the fore wings, and the festooned black and white borders of all the wings.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Continued from p. 238.)

Pyrodes Rheediella, Linn.—Distributed throughout, but not common. The imago appears in May and June, and is to be met with at the flowers of the whitethorn.

Catoptria albersana, Hub.—Not uncommon in the outskirts of woods. The imago occurs in May and June, and flies towards dusk. The larva feeds on the honeysuckle in August.

C. ulicetana, Haw.—Abundant everywhere among furze (*Ulex europæus*). The larva also feeds on *Genista anglica* and *Lotus corniculatus*.

C. juliana, Bent.—Distributed throughout, but not a common species. The imago appears in July, and should be looked for on oak trees or palings near, especially during windy weather. The larva feeds in the acorn in autumn, and is full fed about the time the acorn falls; it then wanders out to pupate, but I do not think the actual change takes place until the spring.

C. microgrammana, Guen.—Local and rare. The imago appears in June and July among rest-harrow (*Ononis*), and has occurred at Deal, Folkestone; Box Hill and Croydon.

C. hypericana, Hub.—Distributed throughout, and not uncommon among St. John's wort. The imago appears in June and July, and flies freely at dusk; it is also easily disturbed in the sunshine. The larva feeds in the heads of *Hypericum perforatum* and *H. hirsutum*.

C. conterminana, H.-S.—Local and rare. The imago appears in June, and is to be met with among various kinds of lettuce. It has been taken and bred in some numbers from the neighbourhood of Dartford.

C. Wimmerana, Wilk. non Treit.—Local. The imago appears in July, and is not uncommon amongst sea wormwood (*Artemisia maritima*) along the bank of the Thames below Gravesend.

C. fulvana, Steph.—Local and scarce. The imago appears in July amongst the great knapweed (*Centaurea scabiosa*), and appears restricted to the chalk. It has occurred at Folkestone, Dover; and Headley Lane, Mickleham.

C. cana, Haw., = *Scopoliana*, Wilk.—Distributed throughout. The imago appears in June and July, and is not uncommon among thistles, particularly in dry situations. It flies freely at dusk, and is also to be seen during the day at rest upon the leaves.

C. Scopoliana, Haw., = *Hohenwarthiana*, Gn., Wilk.—Notwithstanding that the doubts attending the nomenclature of this and the two preceding species have been cleared up by Mr. C. G. Barrett (E. M. M., vol. x., pp. 4—6), some confusion still exists owing to the fact that *Scopoliana*, Wilk., is now known as *Cana*; and *Hohenwarthiana*, Wilk., becomes *Scopoliana*. Common throughout these counties. The imago appears in June and July among black knapweed (*Centaurea nigra*), in the seed-heads of which plant the larva feeds.

C. cæcimaculana, Hub.—Distributed throughout; nowhere common. The imago appears in July among mixed herbage, and chiefly upon the chalk. It has occurred at Croydon, Caterham, Box Hill; Darenth, Folkestone; Brighton and Lewes.

C. decolorana, Frr.—Local. Mr. Machin records having reared this species in some numbers from larvæ feeding in the seed-heads of golden-rod (*Solidago virgaurea*), collected at the end of September and in October, in woods in Kent and Surrey. The imago appears in June and July among golden-rod, and is to be met with on the wing at dusk. Hitherto confounded with the following species.

C. æmulana, Schl., = *modestana*, H.-S., = *tripoliana*, Barrett.—The reasons for altering the nomenclature of this species to *C. tripoliana* will be found in Mr. C. G. Barrett's notes on Tortrices (E. M. M., vol. xvii., p. 84). The imago appears not uncommonly along the bank of the Thames among *Aster tripolium* in July, and flies freely at dusk. The larva feeds in the seed-heads of the same plant, and is full-fed towards the end of September or early in October.

C. expallidana, Haw.—Local and rare. The imago appears in June and July, and is to be found on chalk downs and grassy banks. It has occurred at Folkestone, Dover; and Caterham.

C. citrana, Hub.—Local and rare. The imago appears in July, and has occurred at Folkestone and Hastings. The larva is said to feed in the flowers of *Artemisia campestris*.

Trycheris mediana, W. V.—Local. The imago appears in

July, and I have frequently found them at rest on various flower-heads; it flies in the hot sunshine. The localities are near Strood, Darenth, Folkestone; Mickleham, Croydon; and Hastings.

Simaethis vibrana, Hub.—This species was discovered at Folkestone by Dr. Knaggs, in June, 1860, since which time it has occurred there once or twice singly.

Choreutes scintilulana, Hub.—Distributed throughout in moist and open situations in woods. The imago appears in July and August, and flies with a dancing motion in the hot sunshine. The larva feeds on the common skullcap (*Scutellaria galericulata*).

Xylopora Fabriciana, Linn.—Abundant everywhere among nettles, upon which the larva feeds, and spins a neat white cocoon among the leaves in which it pupates. There appears to be a continual succession of broods of this insect from May to October, and it is sometimes to be met with even later.

X. pariana, Linn.—Abundant throughout. The imago should be looked for in September among apple orchards, and is very partial to the flowers of the marigold, especially in the early morning. The larva feeds on the apple.

Lobesia reliquana, Hub.—Not uncommon in oak woods among the second or third year's growth. The imago is very abundant, flying gently at dusk over the tops of the oak bushes.

L. Servillana, Dup.—Local and rare. The imago appears in May and June among willows, and has occurred at Darenth Wood; and Haslemere.

Eupæcilia nana, Haw.—Abundant everywhere among birch. The imago appears in May and June, and again in August, and is easily to be obtained at dusk flying round the trees, or it may readily be obtained by beating; but the small size of some of the specimens renders them liable to escape notice. The larva is said to feed in the catkins of the birch.

E. dubitana, Hub.—Very abundant on railway slopes and broken ground near London; it appears equally distributed throughout. Like the preceding species it is double-brooded, the imago appearing in May and June, and again in August. I have several times found this species very abundant, both among ragwort and the ox-eye daisy. The imago is only to be seen at dusk, when it flies freely.

E. pallidana, Zell., = *albicapitana*, Cooke.—Local, and

generally to be found on chalk. This species has occurred at Darenth, Folkestone; Box Hill; and Worthing.

E. atricapitana, Steph.—Local. The imago is to be met with among ragwort in chalky districts, in the blossoms and stems of which the larva feeds. The species is double-brooded, in May and August; and has occurred at Charlton, Dover, Folkestone; Box Hill, Caterham; Brighton and Hastings.

E. maculosana, Haw.—Common in all woods in May and June. The imago flies freely in the morning sunshine, and the white under wings of the male render it rather conspicuous. The female is more difficult to catch. There is a second brood in August, but much less plentiful than the spring brood.

E. sodaliana, Haw.—Local and rare. The imago appears in May and June among buckthorn, and has occurred at Croydon, West Wickham, Sanderstead; Darenth, Deal, Folkestone; and Tilgate Forest. The larva feeds on *Rhamnus catharticus*.

E. carduana, Zell., = *hybridellana*, Hub.—Local, but not uncommon. The imago appears in July and August. Mr. C. G. Barrett (E. M. M., vol. xv., p. 141) says the larvæ are in the seed-heads of *Picris hieracioides*, and are full-fed in August and September. It is distributed pretty generally throughout these counties.

E. ambiguaella, Hub.—Local and rare. The imago appears in July among *Rhamnus frangula*, in the berries of which plant the larva is believed to feed. This insect has occurred at West Wickham, Haslemere; and Tilgate Forest.

E. angustana, Hub.—Abundant on heaths and moors, and is also to be found in woods and on chalk slopes. There are a succession of broods from May to the end of August. The larva feeds on heath, plantain, and various other plants.

E. curvistrigana, Wilk.—Rare and local. The imago occurs in July and August among golden-rod (*Solidago virgaurea*), in the flowers of which plant the larva feeds. The localities are Deal, Dover; Lewes, Hastings; and Haslemere.

E. Vectisana, Westw.—Almost entirely confined to salt marshes and river banks. It occurs along the Thames below Gravesend. The imago is to be met with in July.

E. affinitana, Dougl.—Is to be found in similar situations as the preceding species. The imago occurs in July among sea-thrift (*Statice armeria*), upon which the larva feeds.

E. ulana, Gn.—Local. The imago appears in July and August in marshy meadows. The larva feeds in the stems and petioles of the leaves of *Alisma plantago*, boring a gallery in the interior, where it changes to a pupa. It has occurred around London; also at Haslemere, Hastings, and Deal.

E. Manniana, F. v. R.—Very rare and local. A single specimen is recorded by Mr. C. G. Barrett as captured by himself at Haslemere; and one specimen is also mentioned in the list of Hastings and neighbourhood.

E. notulana, Zell. Local. The imago appears in July among *Mentha hirsuta*, in the stems of which the larva feeds. It is not uncommon at Folkestone.

E. rupicola, Curt.—Local, but abundant where it occurs. The imago appears in August among hemp agrimony (*Eupatorium cannabinum*), and flies freely on calm evenings. The larva probably feeds on this plant. The localities are Deal, Dover, Folkestone; Hastings and Haslemere.

E. flaviciliana, Doub.—This species is to be met with on chalk downs in July and August, but is not common. The localities are Sanderstead, Epsom; Deal, Folkestone.

E. roseana, Haw.—Common everywhere among teasle (*Dipsacus sylvestris*). There is a succession of broods from May to August. It can be reared in plenty from teasle-heads collected in the spring.

E. Heydeniana, H.-S.—Not uncommon in one or two localities in the north of Kent; and also at Hastings. There are three distinct broods, appearing in May, July, and September. The larva feeds in the seed-heads and stems of the common chamomile in June, August, and October.

E. ciliella, Hub., = *ruficiliana*, Haw.—Local, but not uncommon where it occurs. The imago appears in May and June, and generally among the common cowslip, in the seed-heads of which, as well as other kinds of *Primula*, the larva feeds.

E. anthemidana, Curt.—Local. There are three broods, appearing in May, July, and August. The larva feeds on *Anthemis cotula*. It is not uncommon in North Kent; and also occurs at Croydon.

(To be continued.)

NOTES ON THE LEPIDOPTERA OF NATAL.

By WILLIAM D. GOOCH, C.E.

(Continued from p. 231.)

PIERIDÆ.

LEAVING the *Papilios*, I must next notice the most delicate Natal butterfly, *Pontia Alcesta*, the first representative of the *Pieridæ*. Mr. Spiller seems not to have met with it yet. It is a bush-frequenter—loves damp shady places in the bush itself; it flies slowly, and is very difficult to catch on account of the thick branches in its bushy haunts; and, from its exceeding fragileness and delicacy, to handle it roughly is to spoil it. It has evenly-rounded wings of diaphanous white with a clouded tip, and one round black spot on the fore wings. It is the only representative of the genus so far known in Natal.

The *Pieridæ* come out in considerable force, although perhaps not being so well represented as might have been expected. The varieties of *P. Agathina* are very interesting, the colour varying from pale yellow to almost an orange. I have bred *P. Agathina*, *P. Pigea*, and *P. Severina*. The larvæ are very similar to the *Pieridæ* larvæ we know so well in England. I agree with Mr. Spiller in his remarks that many of the *Pieridæ*, and especially the genus *Anthocharis*, may be only winter and summer forms of the same butterflies; but in the only two instances where I have been able to test, by breeding, the truth of this opinion, viz., *Anthocharis Omphale* and *Pieris Severina*, I found the winter and summer products were exactly the same. It is true the broods were reared under similar influences in my experiments, being protected from the weather in an open room or verandah. Both were theoretical winter varieties, if we take the vars. with least black as belonging to that season, and they came out similarly in the summer brood. As I said before, the fact of my artificial experiment must not be taken as a certain negation of the alternate brood theory; and I think Mr. Spiller will be doing great service to the cause of Science if he directs his attention to the careful working out of this problem.

The *Anthocharinæ* are great favourites with collectors, and, speaking from my own experience, amply repay the long walk you may take to get to their haunts; for, although they are very local,

a handsome boxfull is soon obtained, as they are also gregariously inclined, and the occurrence of one specimen generally means many. I remember my delight at a fine series of *A. Ione*, with his black encircled violet tip, and *A. Danaë*, with the crimson blotch and black markings, and their respective wives with only black markings, which I took on the edge of a patch of trees and bush in grass-land not five miles from Durban inland. Mr. Spiller speaks of *A. Ione*, but not of *A. Danae*; the latter should be plentiful where he is residing. All the more handsome insects of this tribe have the female much less vivid in colouring. This also is a fact for Mr. Spiller's attention. In the breeding especially the variations of the female and male, even in the larval stage, are very marked, and often significant of derivation or of life necessities.

Two handsome genera of butterflies, rather rare, or at all events local in Natal, and related to the foregoing, are *Idmais* and *Thestias*. They are sometimes abundant in grass-land, more especially on higher ground away from the low coast-lands.

Of *Eronia* and *Callidryas*, as "good wine needs no bush," so these need no recommendation. The beauty of their form and strong flight are most attractive. *E. Leda* is a great favourite, the sulphur wings with orange tips being very brilliant. *E. Cleodora* is handsome, especially the under side. The black margin of the wings varies much in depth with the dry and wet seasons, as has been remarked in *P. Merope*. *C. Florella* is delicately coloured, and is caught feeding at the flowers of *Labiatae* in the afternoon very abundantly. I have seen several *C. Rhadia*. I think it is found more abundantly up in the higher lands, and that may account for Mr. Spiller's having so seldom seen it.

The species of the genus *Terias*, which are not very noticeable, complete the rather full series of *Pieridæ* which Natal yields to a successful net. I do not know the transformation of these latter species.

DANAIDÆ.

The *Danaidæ* claim our attention, not on account of their number, but of the fact that they are the centre upon which mimetic tendencies in the *Papilionidæ* and *Nymphalidæ* seem to meet; *Danaïs Chrysippus*, being mimicked by *Diadema Misippus*, male, and by *Papilio Merope* (var. *ochreus*), female, *D. Echeria*

by *P. Leonidas*, male and female, and by *P. Merope* (var. *Cenea*), female, and *Pseudacræa Tarquinia* and *Diadema Mima*. *D. Ochlea* has been supposed to support a likeness to *P. Pylades* and *Diadema Anthedon*. Of all these instances, the first named and mentioned by Mr. Spiller is specially noticeable, as not only the normal types but the varieties—(a) with suffused apex of fore wing and white hind-wings, and (b) with a central white spot in the hind wings—are all mimicked by the female *D. Misippus*. They are both open-ground and grass-haunting insects. *D. Echeria* and *D. Chrysippus* are both very abundant, and the larvæ are frequent, of which those of the latter do not vary; but those of the former are differently coloured, the female being brighter and more strongly marked than the male larva.

The tentacles or fleshy filaments on the family of the *Danaidæ* are very unmistakable as a mark of the order in the larval, as are the gilt marks in the pupal, state. *D. Ochlea* I do not know in its larval state. It is essentially a wood-haunting butterfly, and when it occurs is generally numerous; but it has a habit of lying dormant two or three seasons, and then appearing in large numbers.

ACRÆIDÆ.

The *Acræidæ*, as Mr. Spiller has sketched them very truthfully, need no remark, except to notice their transformations; of these nearly a dozen, I believe, have been worked out. For myself, I have bred *A. Lycia*, *A. serena*, *A. Petræa*, *A. violarum*, *A. Natalica* (var. *Hypatia*), *A. Zetes*, *A. Eponina* (*Cynthia*), and *A. Esebria* (*Protea*); and I believe *A. punctatissima* and *A. Horta* are known by Mr. Trimen, having been bred by Mrs. Barber in the "Old Colony." The larvæ approach the spiny Nymphalids in type, but the head is not spined; each segment, however, carries an apportioned number; the body is cylindrical and naked; the colouring generally pale. The spines of *A. violarum* are very long, colourless and transparent, and give a very pleasing appearance. The pupa also of this species has six flaccid tentacles, long and recurved, approaching those of the *A. Phalanta* of Natal, but longer and not so brightly coloured.

The *Acræidæ*, like the *Danaidæ*, have "followers." *Atella Zetes* is mimicked by the nymphalideous *Pseudacræa Boisduvalii*, and *A. Aganice* by *P. Tarquinia*. As Mr. Spiller does not mention these *Pseudacrææ* in his list of captures, I am inclined to believe

that it is a good indication how close the resemblance is, for neither of them are rare. *P. Tarquinia* is so like *A. Aganice* when with it on the wing (and they are continually together), that, till you know the exact point to watch, you would pass it over as the latter. Moreover, *A. Aganice*, *A. Zetes*, *P. Boisduvalii*, and *P. Tarquinia* are all high flyers, and not easy on that account to investigate closely. *Acreea punctatissima* is abundant further up country, and is found in open grass, which accounts for Mr. Spiller's non-success. It is interesting because it is mimicked by a day-flying moth; at least, I suppose, the moth imitates the butterfly, it being the rarer of the two. This is not the only example of such mimicry which I shall deal with in my remarks on the day-flying Heterocera.

Newton-le-Willows, Lancashire.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS LATHONIA NEAR DOVER. — *Argynnis Lathonia* has occurred in unusual numbers in the Dover district this season. I append a list of those which have come under my notice. Unfortunately while they were out there was a prevalence of high winds, and many escaped the net in consequence. They are difficult to see on the wing, and more so to mark down, for they have a habit of dropping suddenly from their flight, much the same as a sky lark. The following are placed in their order of capture:—September 7th, one taken by Mr. Gray, and one by a young collector. September 9th, two by Mr. Gray, and two by Mr. Bailey; all taken before one o'clock in the day; also one each fell to Mr. George Gray and Mr. Bailey during the afternoon. On the 10th Messrs. Gray and Bailey each took one specimen. Again, Mr. Gray took one on the 11th, and two were captured by Mr. F. I. Hanbury. On the 13th September Mr. George Gray took another, and purchased one from a boy who had that day captured it. Lastly, Mr. Gray took a single specimen on the 14th September, and subsequently purchased two, but without record of dates of capture. It will be seen that the total captures amount to eighteen specimens. — SYDNEY WEBB; 3, Godwyne Road, Dover.

VANESSA ANTIOPA NEAR YORK.—A very fair specimen of this species was taken in Houghton's Garden, Holgate, on September 17th, and another seen in Messrs. Backhouse's Nursery a few days later.—W. PREST; 13, Holgate Road, York.

VANESSA ANTIOPA IN LANCASHIRE.—I beg to record the capture of this species in this district. On September 2nd a boy caught a specimen at Whittle Hill, Birch, near Heywood. As far as I can get to know it has never occurred about here before. The specimen is now in my possession.—J. W. BENTLEY; Stakehill Works, Castleton, near Manchester, October 1, 1880.

VANESSA ANTIOPA IN KENT.—*Vanessa Antiopa* seems to have occurred in several localities in Kent. At Gravesend, Headcorn, and Herne Bay its appearance has been noted, and to these I can add two more, *viz.*, Knowlton and Fredville, in the neighbourhood of Wingham. These two instances were in the first week of September.—W. OXENDEN HAMMOND; St. Alban's Court, near Wingham, Sept. 7, 1880.

VANESSA ANTIOPA, &c., IN ESSEX.—On the 27th August last I had the good fortune to capture a specimen of this butterfly whilst it was flying round a pond at Ilford. Not having a net with me at the time it received some rough and unentomological treatment, which resulted in its losing not a few of its scales; otherwise it is in perfect condition. From the same neighbourhood I also had brought to me two larvæ of *Acherontia Atropos*, which are now in pupæ.—GEORGE WATKINS; Great Gales, Woodford Bridge, Essex, October 15, 1880.

VANESSA ANTIOPA.—In addition to the notices in this Journal of the occurrence of *Vanessa Antiopa* during the past autumn, the following records have been taken from the 'Field,' and may have been overlooked by some of our readers:—August 17th, one seen at Tonbridge, Kent, by Miss E. C. Thomson; August 19th, one taken in Gravesend by Mr. C. M. Woodford; August 26th, by Mr. S. McCaul, at sugar at Herne Bay; August 24th, by Mr. A. E. Stuart, at Headcorn; August 30th, at Chudleigh, by Mr. John Ellis. During the first week in September the following were observed or taken:—One each at Knowlton and Redville, Kent, by Mr. Oxenden Hammond; two at Ardington, Berks, by Mr. C. L. Lindsay; one at Eastbourne, by Mr. A. Walker; and, as though to wind up the season, Mr. F. Russell picked up a fine

specimen, evidently benumbed by the cold, in a street in Greenwich on October 12th. In 'Land and Water' there is only one record of a capture this season, by Mr. R. Marken, at Combe, near Honiton, Devon. In 'Science Gossip' for October, Mr. Collis Willmott gives a lively account of seeing a couple of *Vanessa Antiopa* in copulâ while flying through the air, but as he gives neither date nor locality the record may refer to another season.—JOHN T. CARRINGTON; October 22, 1880.

THECLA W-ALBUM.—This butterfly appeared in plenty in one particular spot in July, 1873, 1874, 1876, 1877; and in 1875 it literally swarmed on some elm trees. In 1878, 1879 and 1880 it has totally disappeared. This instance proves that an insect will disappear from other causes than slaughter.—W. H. SCOTT; Eastwood Villas, Humberstone Road, Leicester.

APATURA IRIS var. ILIA.—While collecting in Abbot's Wood, Sussex, during the last week in July, I captured a variety of *Iris* with the usual white band on the under wings absent, and the spots on the upper wings smaller, than in the normal type. Unfortunately the specimen was very much shattered, so much so as to be worthless. *A. Iris* was plentiful, but difficult to obtain, owing to the dense undergrowth. Three specimens only fell to my share, all females. Other butterflies were not so common as usual.—J. A. COOPER; 32, Bingley Street, Barnesbury, N.

VARIETY OF POLYOMMATUS PHLEAS.—I recently captured near Shanklin a variety of *P. Phleas*, with the copper colouring superseded by silvery white.—J. H. LEECH; Shanklin, Oct. 9, 1880.

PYRAMEIS HUNTERA.—Referring to Mr. P. H. Gosse's "Notes on the Butterflies of Paraguay, &c." (Entom. xiii. 198), I would remark that *Pyrameis Huntera* (the scarce painted lady of this country) is not uncommon in Canada, where several years since I took some very fine specimens of this exquisitely marked insect on clover (*Trifolium*), in a field near the plains of Abraham, Quebec, the site of the famous battle between Wolfe and Montcalm. I also captured similar specimens in the suburbs of Montreal, on cotton thistle (*Onopordum acanthium*), and smaller and more soberly coloured specimens (probably of the second brood) on a grassy bank at the base of Mount Royal, on the

northern side of the same city.—G. J. GRAPES; 2, Pownall Crescent, Colchester, September 13, 1880.

CHÆROCAMPA CELERIO IN KIRKCUDBRIGHTSHIRE.—On the 8th inst. the gardener at Edenbank, near here, handed me a match-box, with the remark that it contained a big moth that he had taken out of a "speedurt's waab." Judge of my pleasurable surprise when I found it was a very fair specimen of *C. celerio*! It was so recently dead as not to require relaxing. On going to see the place where it was got I was shown a mass of spiders' webs just above the greenhouse stokehole-fire. I have no doubt it had flown to the light. From the same spot, three years ago, I obtained a *Sphinx convolvuli*, which had doubtless been attracted in the same manner. Possibly the unusually fine warm summer we have had here may have something to do with the occurrence of such a rare species as *C. celerio*. But I suppose such queries as "Where had it been bred?" and "How had it wandered so far north?" cannot be answered.—ROBERT SERVICE; Corberry Hill, Maxwelltown, N.B., October 18, 1880.

CHÆROCAMPA CELERIO IN OLDHAM.—I have just obtained a specimen of this rare insect, taken on September 14th, at rest on some pig-iron at an iron-foundry.—JOHN TAYLOR; 228, Chaderton Road, Oldham, October 9, 1880.

CHÆROCAMPA CELERIO AT BURTON.—On the 6th inst. I had a specimen of *Chærocampa celerio* brought to me in very fair condition; it was found in Mr. Bass's brewery-yard.—G. BAKER; Alnis Villa, Ashby Road, Burton-on-Trent, October 12, 1880.

CHÆROCAMPA CELERIO AT SHEERNESS.—I captured a fine and perfect specimen of *Chærocampa celerio* at Sheerness-on-Sea, on October 10th.—J. H. DARLEY; 19, Constantia Terrace, Marine Town, Sheerness-on-Sea, Oct. 14, 1880.

CHÆROCAMPA CELERIO, &c., AT CHICHESTER.—That the past season has not been one remarkably favourable to the lepidopterist will, I expect, be the *dictum* of most collectors. In this neighbourhood the *Papilionidæ* were very poorly represented, except by the two species of *Pieris*, *P. brassicæ* and *P. rapæ*, which, alike in the larval and perfect states, never, I should say, appeared in larger numbers. *Colibris Edusa*, though the clover was exceptionally luxuriant, was to be met with very sparingly, and *Vanessa cardui*

was far less abundant than last year. I can, however, record at least one rarity amongst the *Sphingidæ*—a fine specimen of *Chærocampa celerio*, which flew into the bed-room, and was captured by Mr. Mortimer Hooper on October 1st. It is now on my setting-board. *Cidaria procellata* was one of the commonest Geometers. *Seledosema plumaria* and *Cleora glabraria* were taken; the latter by Mr. J. Purchase, at Kingly Vale, a short distance from the town. This is quite a new locality, I believe, for this almost exclusively New Forest species. Sugar has attracted but few insects, the best being *Cosmia affinis*, *Agrotis puta*, *A. saucia*, *Utocala nupta*, and *Xylina petrificata*; these were from our gardens.—JOSEPH ANDERSON, jun.; Chichester.

CHÆROCAMPA CELERIO IN THE ISLE OF WIGHT.—A specimen of *C. celerio* was taken here on October 8th by a small boy, who picked it up in the street. Unfortunately when it came to me it was in a very battered condition.—J. H. LEECH; St. Paul's Vicarage, Shanklin, Isle of Wight, Oct. 9, 1880.

CHÆROCAMPA ELPENOR, VAR. OF LARVA.—I may add a notice of a form of the larva of *C. elpenor* which is new to myself, though possibly not to others. The larva was found at Sundridge, in Kent, last autumn (I think in August, 1879), and sent to me. It fed up on vine, and changed to a pupa towards the end of the month. Description:—Larva light brown; on 5th and 6th segments a velvet-black ocellus, with a kidney-shaped whitish spot within the black; on the 6th, 7th, 8th, 9th, and 10th segments an oblique lateral stripe of lilac and white, similar to those in the larva of *S. ligustri*, but shorter; horn very short, but not so short as in *C. porcellus*. I had hoped that *C. celerio* would appear, but in August of this year (1880) the pupa having suddenly become very dark in colour, and no imago emerging, after waiting till I was satisfied that the pupa was dead, I broke through the outer skin, and found a perfectly-formed imago of *C. elpenor*, which had died apparently at the very point of maturity. I am well aware of the green form of *C. elpenor* larva, but the lilac stripes were quite new to me.—W. O. HAMMOND; St. Alban's Court, near Wingham, October 6, 1880.

ACHERONTIA ATROPOS.—The larvæ of this handsome moth have occurred in some numbers this season in Essex, especially in the neighbourhood of Ilford and Stratford. Among those who

have been most fortunate in obtaining these larvæ and pupæ is Mr. Rowland.—THOS. EEDLE.

DEILEPHILA LIVORNICA AT BOURNEMOUTH.—On the 27th of September last a specimen of this rare moth was taken at rest from the trunk of an apple tree in a garden in this town. The lad who found it, knowing nothing of moths, carried it alive in a glass to Mr. White, a young friend of mine, who is an ardent collector. Mr. White, after having set it, brought it to me for identification, and I was pleased to be able to inform him that he was the fortunate possessor of an undoubted specimen of *D. livornica*. It is rather remarkable that a specimen of this moth was found last year at rest on a pear tree by a little boy in a garden in Bournemouth, and near the same locality.—W. M'RAE; Westbourne House, Bournemouth, Oct. 9, 1880.

CATOCALA FRAXINI.—I had the pleasure of taking this fine insect at sugar, near this town, on 27th September last. The specimen is in fair condition, but had evidently been some time on the wing.—J. H. A. JENNER; 4, East St., Lewes, Oct. 19, 1880.

DEIOPEIA PULCHELLA IN LINCOLNSHIRE.—I beg to record the capture, by me, of a perfect specimen of *Deiopeia pulchella* in a meadow on the coast not far from here, on August 21st. Being only a young entomologist I was not aware of the rarity of my capture until a week since.—ANNIE DOWS; Boston, Lincolnshire, October 11, 1880.

DEIOPEIA PULCHELLA AT FOLKESTONE.—A fine specimen of this scarce species was captured by my sister on a grass-border in Augusta Gardens, Folkestone, on October 8th. It was evident that it had very recently emerged from the pupa. I hear of another specimen having been taken near Dover.—A. H. MELVILL; St. John's College, Oxford, October 22, 1880.

SESIA CULICIFORMIS NEAR YORK.—In the middle of last June, when walking on the outside of Sandburn Wood at night, I gave a look with my lantern at the flowers of the mountain ash growing in the hedge, and, to my surprise and delight, I saw and quickly boxed a very fine specimen of this species. I beat another from a birch tree during another day. This is the first time I have taken this species near York after collecting here for over twenty years.—W. PREST; 19, Holgate Road, York.

CAPTURE OF *STAUROPOUS FAGI* NEAR DULWICH.—On June 21st last I was lucky enough to capture a fine male *S. fagi* close to Dulwich College. The moth was at rest on a street lamp. I believe this is a new locality, and probably the nearest to London, for this rare moth. I may remark that there are comparatively few birch trees in the neighbourhood.—H. B. PRIM; Leaside, Kingswood Road, Upper Norwood, Sept. 30, 1880.

ACRONYCTA ALNI NEAR MARKET HARBOROUGH.—At the beginning of August I took a larva of *Acronycta alni* at Gumley, near Market Harborough, off wych-elm. It refused, however, to feed on the leaves of that tree, and had probably got upon the branch accidentally. *A. alni* appears to feed on many kinds of leaves, but in this case it kept up its name by taking to alder.—W. W. FOWLER; The School House, Lincoln.

LITHOSIA QUADRA AT EASTBOURNE.—In the October 'Entomologist' I observe Mr. Williams makes a note of having taken *Lithosia quadra* at Folkestone. I may mention that while sugaring near Eastbourne, in the early part of September, I captured two fine specimens, one male and one female.—JAMES TEAROE.

RARE NOCTUINA.—I have just had three capital additions to my collection of *Noctuina*, viz., *Micra ostrina*, taken by a friend on the Dorset coast, and another by Mr. Rogers in the Isle of Wight; also *Noctua flammatrix* and *Micra parva*, likewise taken by Mr. Rogers at Freshwater, the former in July and the latter in August.—C. W. DALE; Glanville's Wootton, October 5, 1880.

NOTE ON THE LARVÆ OF *CLEORA GLABRARIA*.—At p. 207 of the 'Entomologist' for the present year I mentioned that all the larvæ of *Cleora glabraria* I had taken in the New Forest this year had been destroyed by ichneumons. The appearance of these larvæ, after the parasites had spun their cocoons, was precisely the same as that of *Boarmia repandata*, so excellently delineated by Mr. G. C. Bignell, in the 'Entomologist' for October, p. 244. I found that if the larvæ were removed from the cocoons before all the parasites had emerged, they would find their way back to the mass of cocoons and seat themselves again in the same singular manner. At present none of the ichneumons have appeared in the perfect state.—J. JENNER WEIR; 6, Haddo Villas, Blackheath, London, S.E.

VARIETY OF *HEMEROPHILA ABRUPTARIA*.—On the 20th June last I captured a perfectly black variety of the above insect. It was exhibited at the last meeting of the Entomological Society. Was not the insect very late in its appearance? -- A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, Oct. 11, 1880.

DESCRIPTION OF THE LARVA OF *PENTHINA POSTREMANA*.—Not having seen anything written on this larva, except a rough note by my old friend J. B. Hodgkinson in an earlier number of the 'Entomologist,' I enclose for insertion the following description:—Length nearly half an inch; form slightly appressed and attenuate to anus. Colour light yellowish drab, running into bright canary-yellow as it proceeds to the anus. Head narrow, dark, horn-like, glabrous. Corslet rather narrow, of the same colour and texture; 4th to 7th segments constricted, and 3rd and 4th segments puffed out laterally from 7th segment. The attenuation to the anus is pronounced, the anal point being pointed. Feet hardly perceptible, spinous. Feeds in the two lower divisions of its food-plant, and moves freely and quickly up or down; it appears to rest in a cavity it has made in the crown of its food-plant, *Impatiens noli-me-tangere* (the touch-me-not), when full-fed.—C. S. GREGSON; Rose Bank, Fletcher Grove, Stanley, Liverpool, October 20, 1880.

PTEROPHORUS TRIGONODACTYLUS.—I have pleasure in recording the occurrence of this species amongst coltsfoot on Hackney Marshes. When searching for some mallow on the banks of the barge river, about half a mile from Lea Bridge, in June, I observed it flying in some numbers. Having but thirteen boxes with me I was unable to capture more, but I could have taken a much larger number had I been better provided. The second brood was equally abundant on Saturday, 4th September.—W. MACHIN; 22, Argyle Road, Carlton Square, E., September 10, 1880.

DIASEMIA RAMBURIALIS.—While collecting on September 13th, near Dover, in company with my friend Mr. W. P. Weston, I obtained a specimen of this rarity by beating *Eupatorium cannabinum* (hemp agrimony).—REGINALD E. SALWEY; Putney.

MICRO-LEPIDOPTERA NEAR DOVER.—During the past season I have met with the following Micro-Lepidoptera in this district. I did not work especially for any of the species hereafter mentioned, being occupied with working out other entomological

problems. Had I had more time to devote to them I might have taken more than I have, and probably other species:—*Sericoris lacunana* var. *herbana*, *Mixodia Ratzburghiana*, *Pædisca occultana*, *Eupœcilia udana*, *E. flaviciliana*, *E. ruficiliana*, *Cochylis gigantana*, *Depressaria rotundella*, *Yponomeuta evonymella*, *Cedestis farinatella*, *Gracillaria ononiella* (one, which afterwards escaped), *Coleophora conyzæ*, *Batrachedra pinicolella*, and *Chauliodus illigerella*.—SYDNEY WEBB; 3, Godwyne Road, Dover, October 17, 1880.

DORTHESIA CHITON IN IRELAND.—When in Greenland, during the summer of 1875, and searching for the “neat little snail,” *Vitrina angelicæ*, Bk. & Möll., at the base of a cliff in Englishman’s Bay, Disco, amongst a luxuriant growth of *Platanthera hyperborea*, *Luzula spadicea*, and *Polystichum lonchitis*, my attention was attracted to a number of small scaly insects which were adhering to the bases of the stems and dead leaves, amongst which the plants were growing. These proved to be the interesting and curious *Coccus cataphracta* of Shaw, to which the name of *Dorthesia urticæ*, Linn., has been recently bestowed, and which is enumerated in the Appendix to Nares’ ‘Polar Voyage’ as *Dorthesia chiton*, Zett. It was with much surprise and pleasure that, soon after my return from the Arctic Regions, while I was again hunting for small land-shells, this time at the roots of ivy and London-pride saxifrage (*Saxifraga umbrosa*), in a rocky glen at Glenalla, in the County Donegal, I again came upon a very numerous colony of the *Dorthesia*, which I have observed to continue in the same spot for the last three years. More recently I have observed this remarkable insect amongst moss and dead leaves in the “Devil’s Glen,” County Wicklow. Not feeling sure of the name I applied to Dr. F. Buchanan White, of Perth, who has lately described a Scottish species under the name of *Orthezia Signoreti* (see Scot. Nat. iv. 161), and he kindly informed me that he believes mine is the same species; but I find, from information kindly supplied by Mr. J. W. Douglas, that Signoreti, the best authority on the subject, refers the three first names to one single species, in which probably *D. Signoreti* itself would be included, so that I am content with the expressive name of *D. chiton*, Zett., under which I first made acquaintance with the insect.—HENRY CHICHESTER HART; Royal Dublin Society, Kildare Street, Dublin, Oct. 21, 1880.

REVIEWS.

The Transactions of the Yorkshire Naturalists' Union. Parts 1—3.
London: W. Satchell & Co. 1878—80.

THE first work of a local Natural-History Society is to mutually educate its members sufficiently to make them all able to take a part in working out the flora and fauna of the district or region encompassed by its workings. Lectures, papers read, scientific debates, conversazioni, field meetings, and individual collecting, are all means to an end. This end is the publication of a local flora and fauna, and the aim is of course to make it as exhaustive as possible. The Yorkshire Naturalists' Union has arrived at this point, and commenced the publication of its local catalogues of animals and plants in 1878. The three parts now published contain much valuable information in all the series treated of; why the part (3) issued to subscribers for 1878 has only just appeared does not rest with us to enquire. The Union consists of nearly thirty societies, and its publications are arranged in six series, *viz.*:—general, vertebrate zoology, conchology, entomology, botany, and geology. The first and last have not yet made a sign, but all the others record good work; it is however with section D—*Articulata*—only that we are concerned. The Lepidoptera are under the care of Messrs. Porritt (Macro) and Prest (Micro); very able reports have resulted. However, amongst the Macro-Lepidoptera only one additional species to the county is recorded; this was *Carsia inibutata*, taken by Mr. Smethurst on Goole Moor in 1877; the last two years have produced nothing new. This list of Yorkshire species has not yet appeared, so we have no opportunity of judging how complete it may be considered. This part of the report still contains much interesting matter in its minor details, as might reasonably be expected from so large a body of workers. Mr. Mosley contributes a short report on Yorkshire *Psyllidæ*; also a very meagre list of Diptera. Certainly the best report in the section is that of Mr. Roebuck, who, later, had the co-operation of Mr. Bairstow, on Yorkshire Hymenoptera; the forty-eight pages occupied, not only include a very creditable list of species, but some most valuable remarks on the generalities of each family. The reports of the entomological section altogether run to eighty pages. These

Transactions show careful editing, and are well printed on good paper. We congratulate the Union on its publication, and can but hope for a continuance of such healthy work so well turned out.

Praktische Insekten-Kunde. By Prof. Dr. E. L. TASCHENBERG.
Bremen: Heinsius. 1879—80.

From our previous knowledge of Dr. Taschenberg's writings, when this work was announced we had but little doubt that a useful volume would be produced. Our expectations have been more than realised, and we now have a very valuable, comprehensive Manual of Entomology. It is also particularly well illustrated with 330 original woodcuts. These, as might be expected, are far from being of equal merit, but of many we can safely say that they are the most life-like entomological figures we ever saw; the position and surroundings of many of the Coleoptera, Hymenoptera, and Lepidoptera, in their various states, are particularly natural, as well as being artistic; of the Diptera, on the other hand, several of the figures are complete failures.

Professor Taschenberg gives first a short general introduction; then the structure, anatomy, metamorphosis and systematic arrangement of the Hexapods are fully considered. Each of the seven orders of insects are then separately treated of. The general structure, metamorphosis and literature of the order, with the methods of capture and preservation are first given; then a synopsis of the families, followed by the general economy of the genera and well illustrated life-histories of the most characteristic or specially noxious species. Tabular arrangements of the genera and occasionally of the species are frequent, —a great assistance to beginners.

The Neuroptera are dismissed in seven pages of generalities and four pages of specialities, *Chrysopa* and *Panorpa* only claiming attention. In the Orthoptera, Taschenberg includes the *Thripidae*, *Termitidae*, *Psocidae*, *Perlidæ*, *Ephemeridæ*, *Odonata*, *Collembola*, *Thysanura*, and *Mallophaga*, in addition to those families generally contained in the order. In this he follows Erichson, but the arrangement has not been generally accepted. After the Hemiptera (Rhynchota) we have an eighth order containing the apterous parasites (*Anoplura*, *Mallophaga*,

Pulicida, &c.), apparently established for practical convenience. Then certain Acaridea, Araneidea, Myriopods, Isopods, Annelids, and Mollusca, are more or less cursorily treated of. These are specially noted as noxious, but *not* insects.

The whole work is published in five parts, each of which can be purchased separately:—(1) The introduction, containing forty-six woodcuts, price 4s.; (2) the Coleoptera and Hymenoptera, containing ninety-eight woodcuts, price 6s.; (3) the Lepidoptera, containing eighty-three woodcuts, price 5s.; (4) the Diptera, Neuroptera, and Orthoptera, containing fifty-six woodcuts, price 4s.; (5) the Hemiptera, Mallophaga, Acaridea, &c., containing forty-three woodcuts, price 5s.;—complete, 23s. We hardly think the last two parts maintain the high standard of the first three. Each part has a separate index, and a “general-register” is given in part five. This is followed by a list of plants and objects, with the insects that attack them,—often likely to prove a great help to the practical man.

Failing a new edition of Westwood’s ‘Introduction’ collated with Curtis’s ‘Farm Insects,’ both brought well up to date, we can but wish one of two things—either that Professor Taschenberg’s book had appeared in English, or that all British entomologists were sufficiently good German scholars to read it.

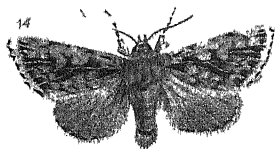
Illustrations of Typical Specimens of Lepidoptera Heterocera in the Collection of the British Museum. Part IV.—North-American Tortricidæ. By Lord WALSHINGHAM. London: printed by order of the Trustees, 1879. 4to.

WE have before us a copy of this work issued by the Trustees of the British Museum, who are to be congratulated upon being the means of showing the world a portion of the valuable work done in North America by Lord Walsingham in the years 1871 and 1872. In addition to describing a great number of new species captured during his collecting tour in the Western States of North America during those years, Lord Walsingham has, in this book, redescribed such of the late Mr. Francis Walker’s types in the British Museum as were imperfectly described. Those who study the relation of a particular group of Lepidoptera from all parts of the world will hail this contribution to the Natural History of the *Tortricidæ* with more than pleasure. The seventeen coloured plates are fully described in the eighty-four

pages of letterpress, and form an interesting subject for examination by the British lepidopterist, who will find a striking similarity between some of the species taken in so remote a place as California and those from our own collecting grounds.

In adopting for this work Heinemann's system of classification as used in his 'Schmetterlinge Deutschlands und der Schweiz,' Lord Walsingham says:—"Many systems of generic subdivision have been suggested for this difficult group, but all appear to have been founded upon a study of European species only. So far as I have been able to judge, none of these various systems are sufficiently perfect and natural to facilitate the arrangement of a cosmopolitan collection. It is very desirable that some comprehensive system should be devised, but for this purpose a very careful study of specimens from all parts of the world is obviously necessary, and it may be long before such a work can be successfully undertaken. Until this has been done, any arrangement of this group of insects must, I think, be considered in part at least provisional." In this we quite agree, for even the limited fauna, so far as regards the *Tortricidæ*, of these islands is not by any means satisfactory in the scientific arrangement generally adopted.

"Our American Cousins" will find the work under consideration a fine addition to the entomological literature of their country; but we cannot help wishing that the same author and the same publishers would undertake as good and well illustrated a Natural History of the British Tortrices, or better still if it extended to the known species of the Palearctic region. Such a work, we need hardly point out, would be a great boon to those of our readers who study this obscure group of Lepidoptera, and we have no doubt would induce many to work who now shirk the apparent difficulties before them. It is a source of gratification to find the public money expended upon such work as that before us, and we should thank the Trustees for the issue of the book above alluded to, which it would be unreasonable to expect from private enterprise. Nevertheless we cannot help thinking it would be a still greater gratification to British entomologists to find the issue of a similar list, of the British Museum series, more closely connected with our own fauna. A work of this character would lead to a better knowledge of, and probably a large addition to, the Tortrices known to occur in these islands.



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[No. 211

THE MACRO-LEPIDOPTERA OF THE SHETLAND ISLES.

By J. JENNER WEIR, F.L.S., F.Z.S.

(WITH A COLOURED PLATE.)

(Concluded from p. 251.)

Hepialus velleda.—The Shetland specimens are very rich in colour in most instances, although amongst them some are much paler than the normal colour of the species; the range of varieties is not nearly so great as in *H. humuli*. A male and female are figured in plate 4.

Nemeophila plantaginis.—The variety *Hospita* of this insect apparently does not occur in Shetland, but some of those captured exhibit a coloration exactly the reverse of *Hospita*, which has the ground colour of the under wings almost white, and the upper wings a very light yellow; those taken by Mr. Meek's collector have the upper wings of a light yellow, and the lower much more darkly coloured.

Agrotis porphyrea.—The Shetland specimens are much larger than any I have seen before, and some are distinguished by a total absence of purple on the wings.

Noctua festiva var. *conflua*.—This insect varies very much: some resemble the ordinary varieties of *conflua*, other in coloration more like *N. Dahlii*, and others are very *N. brunnea*; all are darker than the normal *N. festiva*. Some have a hoary appearance, and indeed present such singular differences that I do not doubt if the more remarkable aberrations were examined separately they would, in the absence of links, be regarded as distinct species.

Pachnobia hyperborea.—This usually very variable insect is not so variable in Shetland as in Scotland; two of the extreme varieties are figured. Some present a rich red ground colour, in others the prevailing hue is slaty grey.

Dianthæcia conspersa.—All the specimens are very much darker than the ordinary colour of the species, and some are almost black and quite devoid of markings, resembling very much, in their dull leaden hue, *D. cæsia*.

Dasypolia templi.—Only three specimens were captured; two of them are very much lighter than the usual colour of the species.

Aplecta occulta.—It is singular that the specimens of this insect are quite as light in colour as the usual southern type, none being dark like those taken in Scotland.

Hadena adusta.—The specimens of this insect are remarkably rich in colour, and with the markings more defined than usual.

Larentia didymata.—The specimens of this insect are darker than usual.

Emmelesia albulata.—None of the specimens collected resemble the normal type. The prevailing colour is difficult to define; to my eyes it appears to be a luteous lead-colour. Some of the specimens are almost without markings. I propose for this insect the subspecific name of *Emmelesia albulata* var. *Thules*.

Eupithecia venosata.—The specimens are of a dull lead-colour with the markings almost indistinguishable owing to the darkness of the ground colour; they resemble those from Ireland, but are much darker.

Coremia munitata.—The specimens taken are of a very lovely purple or vinous colour, far more beautiful than any I have seen before; there is an opaque look about them, and the markings are very sharply defined.

Melanippe montanata.—The specimens taken are tolerably constant in coloration, but they vary very much from the type of the species. It has been thought desirable to figure both sexes of this charming insular variety. It will be seen that the median band is broken up into a series of bandlets, and the under wings are very much streaked with narrow lines. I regard these insects as being among the most beautiful obtained. I propose for them the subspecific name of *Melanippe montanata* var. *Shetlandica*.

Camptogramma bilineata.—The specimens taken are of a pale straw-colour, but, like the type, they vary much in the amount of black suffused over the fore wings.

Melanippe fluctuata.—Only one specimen was taken. This is almost black, with the usual markings very faintly indicated.

It will be gathered from these descriptions that many of the species are darker and duller than the southern forms, whilst, on the contrary, several are lighter; amongst the former may be noticed *Dianthæcia conspersa*, *Melanippe fluctuata*, and *Eupithecia venosata*; and amongst the latter, *Dasypolia templi*, *Aplecta occulta*, and *Camptogramma bilineata*. This appears to me a singular and inexplicable fact.

I think enough has been written to enable all to judge of the value of Mr. Meek's contribution to a knowledge of the Macro-Lepidoptera of the Shetlands; and I do not doubt that he will obtain, both amongst British and Continental entomologists, the credit he so richly deserves.

6, Haddo Villas, Blackheath, London, S.E., October, 1880.

THE MICRO-LEPIDOPTERA OF THE SHETLAND ISLES.

BY HOWARD VAUGHAN.

THE Micro-Lepidoptera observed by Mr. Meek's collector during his sojourn in the Shetland Isles numbered only eighteen species. We are, however, compensated to some extent for this paucity by the addition to our lists of a new *Eupœcilia*, for which I have proposed the name *E. Thuleana*; and also by the beautiful variation exhibited by some of the other species. All, with the exception of *Tinea rusticella*, were obtained from the "Mainland," as the largest island is called. *T. rusticella* occurred only in the Isle of Burra, upon which *Catoptria ulicetana* was also found.

The following were the species captured:—

PYRALIDINA.

Scoparia ambigualis.—One specimen.

S. alpina.—The two beautiful varieties are delineated in plate 4, figs. 1, 2.

Crambus pratellus.

C. culmellus.—Scarce, and do not present any variation from the type.

TORTRICES.

Sericoris littoralis.—These were of a rich brown, and not unlike some of the Irish and Manx examples I have seen.

Mixodia Schulziana.—Brightly coloured, but somewhat smaller than the ordinary Scotch form.

Cnephasia musculana.—These are very pretty, and a striking contrast to our ordinary form. The ground colour is brighter and more silvery, and the darker markings are more intense. In some examples the fascia is broken.

Bactra lanceolana.

Phoxopteryx unguicana.

Pamplusia monticolana.—This and the two preceding species do not display any divergence from the type.

Dicrorampha tanacetana.—The ground colour is somewhat redder than the English forms.

Catoptria ulicetana.—More variegated than our English specimens, but not so brightly marked as those from some of the Scotch localities.

Argyrolepis cnicana.—One large and richly-coloured specimen only was captured.

Eupcecilia Thuleana, n. s. (fig. 3).—A series of this interesting insect, which differs entirely from any of our hitherto known species, was obtained. It is described at page 293, in this number of the 'Entomologist.'

Aphelia pratana.—Only four or five examples were obtained. One of these is a straw-coloured variety, and displays the dark markings very distinctly. The others do not differ from the Scotch specimens I have seen.

TINEÆ.

Tinea rusticella.—Several.

Gelechia ericetella.—A pretty light form.

Glyphipteryx cladiella.—Dr. Wocke gives England as the only locality for this species. I am indebted to Mr. Sydney Webb for identifying the specimens.

55, Lincoln's Inn Fields, October 10, 1880.

EUPÆCILIA THULEANA: A MICRO-LEPIDOPTERON
NEW TO SCIENCE.

EXPANSE $5\frac{1}{2}$ to 6 lines. Head and palpi straw-coloured. Thorax and patagia somewhat darker and interspersed with gray. Fore wings glossy, tawny fuscous. An elbowed whitish line extends from the costa at the junction of the middle and outer thirds to the anal angle. Apex and hind margin dark brown. From the hind margin four dark dashes run towards the elbowed line; fringes fulvous. Costa straight, and apex pointed. Hind wings dark gray, paler towards the base; fringes whitish gray. The sexes are similar, and the species is constant in colour and markings. The wings are rather more pointed than shown in plate 4, fig. 3.

This distinct and interesting addition was discovered by Mr. Meek's collector in the month of June last, in the Shetland Isles. It inhabits the rocky coast of the island called the "Mainland," and flies along the face of the cliffs in the most inaccessible places, and consequently its capture is attended with great difficulty and danger.

I should place *E. Thuleana* between *E. affinitana* and *E. flaviciliana* in Wilkinson's arrangement of the British Tortrices.

HOWARD VAUGHAN.

55, Lincoln's Inn Fields, October 10, 1880.

LEPIDOPTERA OF THE SHETLAND ISLES.

DESCRIPTION OF PLATES.

PLATE 3.

Figs. 1, 3, 5, 7 & 10.—Males of *Hepialus humuli* var. *Hethlandica*, with dark posterior wings. Figs. 7 & 10 represent males with the brown anterior wings of the females.

Figs. 2, 4, 6 & 8.—Males with light posterior wings.

Figs. 9, 11 & 12.—Females of *Hepialus humuli* var. *Hethlandica*.

PLATE 4.

Figs. 1, 2.—*Scoparia alpina*, male and female; varieties.

Fig. 3.—*Eupæcilia Thuleana*, Vaughan.

Figs. 4, 5.—*Emmelesia albulata* var. *Thules*, Weir.

Fig. 6.—*Melanippe fluctuata*.

Fig. 7.—*Eupithecia venosata*.

Fig. 8.—*Camptogramma bilineata*.

Fig. 9.—*Coremia munitata*.

Figs. 10, 11.—*Melanippe montanata* var. *Shetlandica*, Weir.

Figs. 12, 13.—*Dianthæcia conspersa*.

Figs. 14, 15.—*Pachnobia hyperborea*.

Figs. 16, 17.—*Hepialus velleda*, male and female.

THE TORTRICES OF SURREY, KENT, AND SUSSEX.

BY WALTER P. WESTON.

(Concluded from p. 272.)

Xanthosetia hamana, Linn.—Common throughout, the imago appearing from June to August amongst thistles. The perfect insects vary considerably in colour and markings.

X. Zoegana, Linn.—Generally distributed, but more local than the preceding species. The imago occurs from May to September, but I am inclined to believe there are two separate broods, as the August specimens are richer in colour than the spring ones. According to Wilkinson the larva feeds in the roots of *Scabiosa columbaria*.

Chrosis tesserana, Treit. Common throughout, among broken ground and mixed herbage. The imago is to be met with from May to August, and flies freely in the hot sunshine, as well as at dusk. It is very variable both as to ground colour and markings.

C. rutilana, Hub.—Local. The imago appears in July and August among junipers, and is best looked for late in the afternoon, when the insect flies from twig to twig; but is not very easily taken. The larva feeds in a slight web on the shoots of the juniper, in April and May. It occurs at Croydon, Caterham, Box Hill, and Sanderstead.

C. bifasciana, Hub. = *Audouinana*, Dup.—Local and scarce. This insect is much out of position in our lists, as it is very closely allied to *A. Conwayana*, with which it is placed by Dr. Wocke. The imago appears towards the end of May and in June, and is to be taken on the wing at dusk. The localities are Haslemere; Darenth, Strood, Tonbridge; and Tilgate Forest.

Argyrolepis Hartmanniana, Clerk. = *Baumanniana*, Schiff.—Rather local. The imago appears in May and June among rushes in damp places. It has occurred at Haslemere; Darenth; Tilgate Forest and Hastings.

A. subbaumanniana, Wilk.—Local, and confined to the chalk. The imago appears in June and July, and has occurred at Croydon, Sanderstead, Mickleham, Box Hill; Darenth, Dover, Folkestone; Lewes, Brighton, &c.

A. zephyrana, Treit. = *Dubrisana*, Curt.—Local, but not uncommon. The imago appears in July and August, and is on the wing in the sunshine. The larva feeds in June in the roots of *Eryngium*, &c., and changes to a pupa the following

month. The localities are Haslemere, Croydon, Box Hill; Tunbridge Wells, Margate, Dover, Folkestone; Lewes, and Brighton.

A. badiana, Schiff. — Rather local. The imago appears in July and August among *Arctium Lappa*, in the roots of which the larva feeds. It used to be common at Darenth, and also occurs at West Wickham; Dover, Folkestone, and Hastings.

A. cnicana, Doub. — Rather local. The imago occurs in May and June among thistles, but always in damp localities. It occurs at Haslemere and at Esher.

A. aneana, Hub. — Local and not common. The imago appears in June and July among ragwort, in the roots of which the larva feeds. The localities are Haslemere; near Strood, Folkestone.

A. Mussehliana, Treit. — This long-lost species has been taken at Deal by Messrs. Howard Vaughan and W. Purdey.

A. maritimana, Guen. — The species was first taken at Deal in 1854 by Mr. H. J. Harding, who found the larvæ feeding in the roots and stems of sea holly (*Eryngium maritimum*), from which he bred the perfect insect the following year.

Cochylis dipoltana, Hub. — Local. The larva feeds in a web among the seeds of yarrow in the autumn and winter; the imago appears in July and August, and has been taken at Croydon, Box Hill, Guildford; Charlton, Folkestone; and Worthing.

C. francillana, Fabr. — The imago is not uncommon around London amongst *Daucus carota*, and flies freely at dusk in July and August. It is also recorded from Sanderstead, Forest Hill, Croydon, Riddlesdown, Box Hill, Guildford; Darenth, Dover, Charlton, Folkestone; Lewes and Brighton.

C. dilucidana, Steph. — Widely distributed. The larva feeds in the stems of the wild parsnip (*Pastinaca sativa*); the imago appears in July.

C. Smeathmanniana, Fabr. — Local and uncommon. The imago appears in May and June, and flies freely at dusk. The larva feeds in the heads of *Achillea millefolium*, *Centaurea nigra*, &c. Its capture is recorded from Barnes, Croydon; Lewisham, Darenth, Dover.

C. straminea, Haw. — Widely distributed throughout, but not common. The imago appears in May and June among *Centaurea nigra*, in the heads of which the larva feeds.

C. alternana, Steph. = *gigantana*, Guen. — This species appears restricted to the south-east corner of Kent, where, in some seasons, it is not uncommon. The imago appears in August and September among *Centaurea scabiosa*, in the heads of which the larva feeds.

C. inopiana, Haw.—Local. The imago occurs in June and July among fleabane (*Inula dysenterica*), and flies freely at dusk. It has occurred at Darenth, near Strood, Deal, Dover, Folkestone; and Hastings.

Aphelia osseana, Scop. = *pratana*, Hub.—The imago appears in July and August, and is very abundant on all downs and other similar localities on the chalk.

Tortricodes hyemana, Hub. — Abundant in all lanes and woody districts in the early spring. The female is more sluggish in her movements, and, when beaten out, usually drops.

ERRATUM.

Eupœcilia pallidana, Zell. = *albicapitana*, Cooke, was inserted by mistake in the above list, and must be struck out.

ADDENDUM.

Peronea potentillana, Cooke.—Bred last year by Mr. William Purdey, of Folkestone, and by Mr. Howard Vaughan, to whom he sent pupæ, from larvæ found feeding in rolled-up leaves of wild strawberry at Folkestone.

Before closing the above list, I must express my thanks to Mr. C. G. Barrett and Mr. Howard Vaughan for much valuable assistance during the progress of this article, which has reached far greater length than I originally intended. Before commencing, I solicited (through advertisement in this magazine) local and private lists from entomologists working these counties. Of local lists, the only one of any assistance was that of Hastings and neighbourhood, kindly sent by the Rev. E. N. Bloomfield and Mr. E. A. Butler; while the private lists were still more disappointing. I was therefore obliged to depend largely on recorded localities, and those worked by myself and my own immediate friends. This must be my apology for certain localities being so frequently mentioned, while others equally favourable are almost entirely omitted.

Auburn Villa, Putney, S.W., November, 1880.

INTRODUCTORY PAPERS ON *ICHNEUMONIDÆ*.

By JOHN B. BRIDGMAN AND EDWARD A. FITCH.

No. II.—*ICHNEUMONIDÆ* (continued).

A CAREFUL study of the foregoing tables will fully bear out our prefatory remarks as to the amount of variation existing in this somewhat extensive genus. Most of the species occur twice, owing to sexual variation; many are mentioned three times; *I. computatorius* and *I. varipes* occur four times; and *I. lineator* is so variable that it occurs seven times, and even in three sections (1, 3, and 8). This close affinity, constant variation, or the difficulty in rightly connecting the two sexes,—not always easy to determine, though the male is generally more slender,—often apparently distinct species, makes the genus *Ichneumon* especially puzzling to the beginner. Several teratological varieties of *Ichneumon* have been recorded and figured. Wesmael records three cases of gynandromorphism, none bilateral, but one fairly complete: that of *I. luctatorius* with its *extensorius* female (coloured plate, Bull. Ac. Brux., vol. iii., 1836); the other two cases are specimens of *I. comitator* and *I. nigritarius* which are partially gynandromorphous (Bull. Ac. Brux., xvi., pt. 2, p. 378). Tischbein describes and figures (Stett. Ent. Zeit., xxii., 428; pl. i., fig. 3) a polymelian *I. luctatorius* which has two well-developed tarsi, each with the normal five joints but one with only a single claw, on the right hind tibia, which is one-sixth shorter than the normal and left-hand one. In the National Collection there is a British specimen of *I. impressor* (*nigricornis*) with no areolet in the right fore wing: irregular neuration is not rare in the Hymenoptera, but had both wings of this *Ichneumon* been thus curiously abnormal it would probably have long remained a unique species (? genus). There is a constant variety of *I. latrator* female with abbreviated wings, which led Gravenhorst to establish a new genus (*Brachypterus*) for it, and Förster included it amongst the *Pezomachi* as *Pterocormus means*; this variety and the normal type are not uncommon in Britain, being frequently found, like many of the *Ichneumonidæ*, under moss or loose bark from autumn to spring. This interesting variety, unique in this family, has been figured by Stephens, Wesmael, and Vollenhoven (twice). Until quite lately there have been but few figures of *Ichneumon*.

Albin, Donovan, and some of the earlier English authors figured species which, although fairly good, are hardly capable of identification with certainty; so also with the figures of Réaumur and DeGeer. Coquebert figured *I. Coqueberti* (*fusorius*); there are good coloured figures of *I. primatorius* (*grossorius*) and *I. flavatorius* in Panzer; this latter species is also figured by Ratzeburg, as well as *I. dumeticola* (*piniperdæ*), *I. pisorius*, and *I. nigritarius*; *I. dimidiatus* is beautifully figured (coloured) by Westwood in Stephens' 'Ill.-Mandib.' We now have excellent figures of twelve British species belonging to this genus in Vollenhoven's 'Pinacographia.' The identification of an *Ichneumon* would thus appear as difficult as it may be interesting, but our table will at least serve to determine a specimen as one of two or three species, and then the respective descriptions of Gravenhorst, Wesmael, Holmgren, or other authority should be consulted. It must, however, be remembered that colour and size are the most liable to variation; sculpture is generally constant. Marshall's Catalogue includes 144 species, and in the 'Entomologist's Annual' for 1874, *I. vulneratorius*, Zett., is added, where see the synonymy as copied from Holmgren; but Wesmael's *I. hæmatonotus* is a distinct species (Ent. Tid. i. 78). This is included in the table, and all Marshall's species, except his numbers 60, 61, 114, 119, and 136. Of these *I. variegatorius* (60) and *I. leucostigmus* (61) were included by Wesmael in a new genus *Hepiopelmus*; this is followed by Tischbein, and reluctantly by Vollenhoven; but since it appears desirable, such will be done here. *I. cerinthius* (114) is an *Amblyteles*, and will appear in that genus. *I. deceptor* (119) is retained on the strength of Gravenhorst's var. 5 alone, who says, "Marem unicum, circa Netley captum Hope mihi misit"; it was not in Marshall's 1870 Catalogue, and is, we think rightly, omitted here. The male of *I. perileucus*, Gr., is *Amblyteles funereus* (in 'Ent. Soc. Cat.,' p. 24, l. 8, for male read female), and the female *I. perileucus* (var. 1), Gr., is *A. fossorius*; Marshall gives *I. perileucus* (36) in the genus *Ichneumon*, with a reference to Stephens, but he describes both male and female; therefore, to save more confusion, the species is not included here. There are several species already casting their shadows on the British fauna, but they cannot now be referred to.

A study of a series of bred* specimens in many species of

Ichneumon would probably lead to a very material alteration of the specific or diagnostic characters. It has been already stated that the *Ichneumonidæ* are exclusively parasitic on Lepidoptera, and if these had not been so generally despised by lepidopterists, as at present, it is probable that we should have a much better knowledge of their systematic arrangement. There are few good collections of British *Ichneumonidæ*; that in the British Museum is very rich in specimens, but from its almost chaotic arrangement this vast *material* is nearly valueless; it contains the rich collections of J. F. Stephens (which included those of Francillon, Marsham, Haworth, Donovan, &c.) and T. Desvignes; three hundred and twenty-five ichneumons (many still unique) from Heysham's collection were purchased at Stevens's; besides many specimens since added by Walker, Smith, Marshall, and others. Ruthe's general collection of *Ichneumonidæ* is also in the Museum, and two hundred and forty-seven Gravenhorstian types, sixty-one of which belong to this family. The Hopeian Collection at Oxford contains of European ichneumons:—(1) an old collection, probably named by Fabricius; (2) several drawers filled with Gravenhorst's types; (3) many species named by Stephens; (4) a small collection received from Förster; (5) the Saundersian collection, arranged by F. Smith; (6) Westwood's British collection; (7) a small collection received from Wesmael; (8) the greater part of F. Walker's British collection; (9) several drawers of undetermined British specimens, mostly collected by Rev. F. W. Hope. The Linnean collection is at Burlington House.

The species of *Ichneumon* are all solitary in their parasitism, never more than one living in the same host; when more is known of their biology it will probably be found that many species are conditionally monophagous, that is, they are always attached to the same or a closely allied lepidopteron, but to this possible rule we already know of several conspicuous exceptions amongst the commoner species. It appears that the mother *Ichneumon* mostly attacks its victim larva when nearly or quite full-fed, but the manner or time of oviposition has seldom been observed; as many Lepidoptera, especially *Noctuæ*, hibernate as larvæ, it is probable that oviposition takes place in the spring. The species of *Ichneumon* mostly emerge in the late summer or autumn, and very many of these are known to hibernate as imagos, especially

the females; however, in Ratzeburg's interesting 'Krankengeschichten' (Nos. 4 & 5) several species are mentioned as appearing from April to June; these were from *Trachea piniperda*, from which Ratzeburg bred twenty-six to twenty-eight different ichneumons. Another possible rule is that the time of appearance of the parasite is about the same as that of its host. We know that a larva exhibits little or no sign of being affected when a species of this family is the preyer; it is not so in many other cases of ichneumon parasitism. If a full-fed larva or pupa be more sluggish or of a darker colour than usual, or if it does not emerge at the proper season, it probably contains a parasite. In no known instance does the host of *Ichneumon* die till it becomes a pupa; hence the emergence of a parasite belonging to this genus, or even family, instead of the lepidopterous imago, is frequently quite unexpected. The *Ichneumon* pupa invariably, we believe, lies with its head in the same direction as that of its host, whose pupa-skin is filled with a thick fluid which varies in consistency and colour—yellowish or greenish; this surrounds the naked *Ichneumon* pupa, and in some species the whole abdomen of the pupa is filled with the fluid. After emergence the affected pupa may easily be recognised. In the usual metamorphosis of the lepidopteron the pupa is ruptured on the thorax, and the wing-cases invariably broken along the antennæ; where an *Ichneumon* has emerged these are entire, the pupa-case being opened with a clean transverse cut just below the eyes; sometimes the anterior part is cut quite off, but more often a portion of the pupa-case is unsevered, whether dorsal or ventral seems immaterial. A detailed description of the larva and pupa of *I. pisorius* is given by Ratzeburg ('Die Ichneumonen,' i., 131), who tells us he was well acquainted with those of many species.

Every available authority has been consulted for the compilation of the following list of *Ichneumon* hosts, but its accuracy cannot be fully relied upon, from the difficulties of identification and errors of synonymy. The species are numbered as in Marshall's Catalogue; the author of the biological information is quoted in each instance, the name being given in Roman letters after the name of the ichneumonized insect; those Lepidoptera not now known as British are marked with an asterisk.

1. *pisorius*, *L.* from *Smerinthus ocellatus*; Bouché. *S. populi*; Bouché. *Sphinx ligustri*; Ratzeburg. *S. pinastri*; Hartig. Ratz., Brischke. *Ptilodontis palpina*; Giraud. *Tryphæna pronuba*; Gir. *Hadena pisi*; Linné, ? Ratz.
2. *bilineatus*, *Gmel.* „ *Abraxas grossulariata*; Vollenhoven. *Bryophila glandifera*; Bignell.
3. *simulatorius*, *Fabr.* „ *Melanippe luctuata**; Brischke (very near *M. tristata*).
4. *Coqueberti*, *Wesm.* „ *Callimorpha dominula*; Boie.
5. *Bohemani*, *Holmgr.* „ *Noctua*; Brischke.
6. *sugillatorius*, *L.* „ *Liparis monacha*; Ratz.
9. *leucocerus*, *Gr.* „ *Acronycta megacephala*; Gir.
10. *lineator*, *Fabr.* „ *Bombyx*; Stephens, Brischke. *Ypsipetes elutata*; Boie. *Eurranthis plumistraria**; Gir. *Bryophila glandifera*; Rondani. *Nonagria geminipuncta*; Weston. *Noctua*; Porritt. *Tortrix cratægaua*; Goureau.
14. *rufinus*, *Gr.* „ *Hemithea thymiaria*; Brischke. *Ophiodes illunaris**; Kirchner.
15. *impressor*, *Zett.* „ *Gortyna flavago*; Bridgman.
16. *ruficaudus*, *Wesm.* „ *Cosmia trapezina*; Brischke.
17. *comitator*, *L.* „ *Bombyx*; Steph. *Cleora viduaria*; Speyer (Ratz.) *Fidonia piniaria*; Muss (Hart.). *Abraxas grossulariata*; Steph. *Plusia gamma*; Rond.
20. *fuscipes*, *Gmel.* „ *Noctua*; Brischke.
21. *periscelis*, *Wesm.* „ *Noctua*; Brischke.
22. *pistorius*, *Gr.* „ *Orgyia pudibunda*; Voll.
23. *culpator*, *Schr.* „ *Melitæa Athalia*; Rond. *Setina aurita**; Fallou (Gir.). *Trichiura crategi*; Rond.
25. *trilineatus*, *Gmel.* „ *Abraxas grossulariata*; Ratz., Holmgr., Brischke, Barrett, Bignell.
- Var. *umbraculosus*, *Gr.* „ *Arctia caja*; Steph. *Abraxas grossulariata*; Steph. *Trachea piniperda*; Brischke.
26. *scutellator*, *Gr.* „ ? *Liparis chrysorrhæa*; Réaumur. *Abraxas grossulariata*; Kawall. *Trachea piniperda*; Ratz.
27. *multiannulatus*, *Gr.* „ *Dicranura vinula*; Marshall.
28. *molitorius*, *L.* „ *Noctua brunnea*; Boie. *Trachea piniperda*; Brischke.
29. *punctus*, *Gr.* „ *Caradrina* sp.; Gir.
30. *computatorius*, *Müll.* „ *Orgyia pudibunda*; Tischbein.
32. *vaginatorius*, *L.* „ *Diloba cæruleocephala*; Graff (Ratz.). *Noctua*; Brischke.
33. *xanthorius*, *Forst.* „ *Polyphænus sericata**; Mocsary.
34. *confusorius*, *Gr.* „ *Dicranura bicuspis*; Marshall. *Nonagria nexa**; Brischke. *N. sparganii*; Voll. *Gortyna flavago*; Boie, Drewsen, Brischke. *Tryphæna pronuba*; Steph. *Noctua bella*; Voll. *Noctua*; Steph., Brischke. *Cucullia Santonici**; Wulschleger.

37. *gracilentus*, *Wesm.* from *Nonagria sparganii*; Voll.
 42. *luctatorius*, *L.* „ *Vanessa Polychloros*; Nees (teste Gr.). *V. urticæ*; Gir. *Satyrus Janira*; Schunidt (Ratz.). *Polyommatus Circe**; Rond. *Lycæna Cyllarus**; Goureau.
 53. *formosus*, *Gr.* „ *Chelonia plantaginis*; Brischke. *Arctia fuliginosa*; Gravenhorst.
 57. *raptorius*, *L.* „ *Satyrus Janira*; Brischke. *Liparis monacha*; Ratz. *Liparis*; Rond.
 62. *quæstorius*, *L.* „ *Nonagria typhæ*; Desvignes, Fitch. *N. geminipuncta*; Desvignes, Marshall.
 63. *cessator*, *Müll.* „ *Vanessa Polychloros*; Brischke. *Acronyeta* sp.; Gir.
 67. *saturatorius*, *L.* „ *Dicranura vinula*; DeGeer. *Meliana flammea*; Boie. *Calamia phragmitidis*; Boie. *Plusia* sp.; Gir.
 69. *nigritarius*, *Gr.* „ *Eriogaster lanestris*; Harrach. *Angerona prunaria*; Harrach. *Macaria liturata*; Ratz. *M. signaria**; Rond. *Fidonia pinaria*; Ratz., Brischke. *Clostera reclusa*; Voll. *Trachea piniperda*; Boie, Ratz., Brischke. *Tæniocampa miniosa*; Desvignes (B. M. Coll.). *Plusia gamma*; Steph. *P. festuæ*; Steph. *Noctua*; Steph., Ratz., Dours.
 71. *fabricator*, *Fabr.* „ *Orgyia pudibunda*; Ratz. *Macaria lituraria*; Ratz. *Notodonta dromedarius*; Marshall. *Axylia putris*; Bridgman. *Trachea piniperda*; Hart., Ratz.
 73. *pallidifrons*, *Gr.* „ *Trachea piniperda*; Brischke.
 74. *maculifrons*, *Steph.* „ *Amphydasis prodromaria*; Steph.
 75. *coruscator*, *L.* „ *Agriopis aprilina*; Grav.
 76. *jugatus*, *Gr.* „ *Fidonia pinaria*; Brischke.
 80. *pallidatorius*, *Gr.* „ *Lithosia rubricollis*; Gir. *Cidaria corylata*; Brischke.
 83. *vacillatorius*, *Gr.* „ *Depressaria heraclella*; Bigucll.
 84. *monostagon*, *Gr.* „ *Nonagria geminipuncta*; Voll. *N. sparganii*; Voll.
 85. *dumeticola*, *Gr.* „ *Lithosia quadra*; Gir. *Trachea piniperda*; Ratz.
 87. *oscillator*, *Wesm.* „ *Trichiura crategi*; Rond.
 89. *chionomus*, *Wesm.* „ *Geometra*; Brischke.
 91. *flavatorius*, *Fabr.* „ *Smerinthus tiliæ*; Steph., Rond. *Liparis salicis*; Boie. *L. dispar*; Steph., Gir., Voll. *L. monacha*; Ratz., Kawall.
 94. *callicerus*, *Gr.* „ *Hadena adusta*; Brischke.
 96. *derogator*, *Wesm.* „ *Macaria liturata*; Ratz. *Trachea piniperda*; Boie, Ratz.
 97. *bilunulatus*, *Gr.* „ *Orgyia pudibunda*; Rond. *Trachea piniperda*; Ratz., Voll., Brischke. *Hadena adusta*; Brischke.
 Var. *derivator*, *Wesm.* „ *Fidonia pinaria*; Brischke.

99. ochropus, *Gmel.* from Abraxas grossulariata; Steph., Brischke.
102. exornatus, *Wesm.* „ Macaria liturata; Graff (Ratz.). Cidaria
fulvata; Hart., Ratz.
106. albicinctus, *Gr.* „ Fidonia pinariia; Bernuth, Ratz., Brischke.
126. gasterator, *Steph.* „ Depressaria heracleiella; Marshall.

HOPLISMENUS, Gr.

Antennæ white-ringed (*perniciosus* male, generally with no ring).
Scutellum pale.

- A. Abdomen red, or red and black (1st—3rd segments testaceous in *aulicus*).
 a. Hinder tarsi black, 2nd—4th joints pale.
 All the femora and front tibiæ red (hinder legs sometimes more or less black). - 1. *pernicius*, 4—5 lines, male and female (*h*, *s*, *l*, *a*).
 b. Hinder tarsi yellowish, also tibiæ and front tarsi.
 3. *aulicus*, 4½—5 lines, male.
 B. Abdomen tricoloured; femora and tibiæ red; apex of hinder black; hind tarsi white-ringed (legs sometimes more or less black or brown).
 2. *uniguttatus*, 4 lines, male and female (*a*, *l*).

The species of *Hoplismenus* appear to be uncommon in Britain. Some thirteen species are known on the Continent, most of which ought to occur here. *Ichneumon exornatus*, Wesm. (= *pictus*, Gr.), *Platylabus dimidiatus*, Gr., *P. errabundus*, Gr. (= *albinus*, Gr.), were all included in *Hoplismenus* by Desvignes; his *H. semirufus*, described in the B. M. catalogue, is also a *Platylabus*. Five species of this genus are known to be parasitic upon butterflies. *H. perniciosus*, our commonest species, was bred by Giraud from a *Satyrus Mæra** pupa, and Brischke bred *H. bidentatus*, Gr. (var. of *perniciosus*, teste Marshall), from *Aspilates strigillaria*. Kriechbaumer says *H. aulicus* is probably attached to a willow- or sallow-feeding larva. He also met with the female, which Tischbein has described; making a new genus (*Hybophorus*) for this species amongst the *Ichneumones amblypygi* near *Trogus* (Stett. Ent. Zeit. xxxvi. 280).

EXOPHANES, *Wesm.*

Scutellum yellow or whitish. Females, abdomen, 2nd, 3rd, and sometimes part of 4th segments red, anus white; males, 2nd—4th red (a); 2nd, 3rd, and sometimes a spot on 7th, yellow (b.)

- | | | |
|------------------------------------|-------|----------------------------------|
| a. Hind femora black. | - - - | 1. <i>exulans</i> , 4½—5 lines. |
| b. Hind femora reddish or fulvous. | - - - | 2. <i>occupator</i> , 5—6 lines. |

Our two species of *Exophanes* are fairly common, and they are very liable to be mistaken for similarly-coloured species of

Ichneumon; *E. occupator*, male, especially resembles the *luctatorius* group. In *Exophanes* the gastrocæli are hardly distinguishable: this is a good distinctive characteristic. Both our species, in which the sexes differ greatly, are well figured by Vollenhoven ('Pinacographia,' pl. 2, figs. 3 & 4). The common *E. exulans*, which is better known by its female name (*hilaris*), Vollenhoven tells us, was bred in June from *Tapinostola Elymi*. Holmgren first bred *E. occupator* from *Nonagria typhæ*, and Swierstra bred it from *Nonagria sparganii* (teste Vollenhoven); while Vollenhoven also bred it from *N. typhæ*. In the third week of August, 1879, Mr. W. R. Jeffrey bred this species from British *N. sparganii* pupæ.

(To be continued.)

NOTE ON THE GENUS *ORTHEZIA*.

By F. BUCHANAN WHITE, M.D., F.L.S.

As Mr. H. C. Hart in recording, in the last number of the 'Entomologist' (Entom. xiii. 284), the occurrence in Ireland of *Dorthesia chiton* alludes to me, I am tempted to make a few remarks on this interesting insect.

In the first place there is a difference of opinion as to which is the correct generic name, *Orthezia* or *Dorthesia*. The name was created in honour of the Abbé d'Orthez, and was written "*Orthezia*" by Bosc, who, in the 'Journal de Physique' for 1874 (p. 171), published a memoir, entitled "Description de l'*Orthezia characias*." In the same journal for the following year, 1875 (p. 207), the Abbé d'Orthez himself changes the orthography of the name to "*Dorthesia*," and many authors have adopted his name. Bosc, the author of the genus, entitled it *Orthezia*, and no other can be used, as *Orthezia* and *Dorthesia*, considered as scientific names, are quite different words. In adopting *Orthezia* I only follow Amyot, Serville, and Signoret.

In the second place as to the species. Of these (excluding one or two extra-European ones) no less than ten or eleven have been described, but almost all of them seem to be identical with *Urticæ*, L. (*Aphis urticæ*, L., Syst. Nat. ii. 733, 30); or at least that is the conclusion that Signoret, in his recent classic 'Essai sur les Cochenilles,' arrives at. He says that he has met with

specimens in several countries, and received them from others, and that they are all referable to *Urticæ*, L., and suggests that the various so-called species that have been described have been founded on different states of *Urticæ*. The names Signoret cites as synonymous with *Urticæ*, L., are:—*Characias*, Bosc; *Delavauxi*, Thibaut; *Floccosa*, De Geer; *Cataphracta*, Shaw; *Chiton*, Zett.; ? *Uva*, Modeer; *Glechomæ*, Fab. sec. Burmeister; *Dubius*, Panzer; *Dispar*, Kaltenb. Signoret is probably right in sinking most of these so-called species, but it seems to me possible that one or two of them may be really distinct from *Urticæ*, though probably not recognisable by the published descriptions. Amongst these may be Zetterstedt's *Chiton* (of which I have not seen a description), but there is many a conjecture induced by the northern habitat. I should much like to know on what grounds Mr. Hart has identified his Greenland specimens with Zetterstedt's species.

As to my *Signoreti* it is thoroughly distinct from *Urticæ*, L. The shape of the antennæ and the different proportions of the front legs serve to separate it at once. It is far from rare in Scotland, where *Urticæ* also occurs; but the latter I have found only in the south-west and near Glasgow. It is quite possible that *Signoreti* may be identical with *Chiton*, Zett., in which case we will have to adopt the latter name. In Ireland I should expect both *Urticæ* and *Signoreti* to occur; and if Mr. Hart will continue his search he will no doubt meet with both. From England I have seen *Urticæ* only. It occurs in the neighbourhood of London, and probably in many other places. *Signoreti* may very probably occur in the more mountainous districts. I shall be happy to name any specimens that may be entrusted to me.

A brief description may be useful to those who are not acquainted with these interesting insects. In form they (or at least the females and larvæ) are flattish and oval, and often under the twelfth of an inch in length. In colour usually of a dead white (but sometimes slightly discoloured) from the numerous flakes and layers of a calcareous-like secretion (probably waxy in its nature) with which they are covered; the legs and antennæ generally brown or pinkish brown. The males only are winged, and are in appearance and colour (a clear brown) very different from their humble partners, which are far more commonly met with. The calcareous-like secretion with which the females are

covered forms a kind of bag at the end of the abdomen, in which the eggs are deposited and hatched. The young larvæ are like their mother, but differ in the number of the joints of their antennæ, &c.; and the form of the male and female larvæ is somewhat different. Like other hemipterous insects, the mouth is formed for sucking.

Orthezia Signoreti usually lives amongst mosses, or under decaying leaves of ferns and other plants; and, like Mr. Hart, I first met with it when looking for land shells. It is very sluggish in habit, scarcely moving at all when found, but tucking its legs and antennæ underneath it looks somewhat like a small flat seed, or like the cocoon of some other insect.

O. Urticæ, on the other hand, lives more exposed, and occurs upon various plants, such as the greater stitchwort (*Stellaria holostea*), nettle, geranium, *Euphorbia characias* (whence the name *Orthezia characias*), &c.

D'Orthez, who carefully studied the habits of this insect, says that the larva of a beetle attacks and devours the eggs in the maternal pouch, but without attacking the mother.

Though placed amongst the cochineal, or scale-insects, *Orthezia* has many peculiarities, and is well worth studying.

Perth, November 13, 1880.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

DESCRIPTION OF THE LARVA OF *ACIDALIA OCHRATA*. — This extremely local species has not hitherto been recorded as bred in England. The following notes will be of interest:—The eggs are not apparently attached to the food, but dropped loosely amongst it. They hatch in a few days, about the first week in August. Having no information of food-plant, a general selection of the most probable was made, and placed in a wide-mouth bottle for their choice. For the first week, so little sign was there of any feeding that I feared I had lost them. After two or three weeks, although they made very little progress, still they were alive, and must have eaten something. Generally, most of the little larvæ were on or near *Galium verum* flowers, one of the plants supplied. Still being so small the frass was hardly perceptible; as time went on it became more apparent that they ate only, or at any rate principally, the withered flowers of the *Galium*. During the month of August, as long as this plant

could be obtained in bloom, it was continued as food; when this could no longer be obtained I had to seek some other food, and early in September I tried flowers of golden-rod. The larvæ took to this readily enough, although evidently not a natural food, as the golden-rod did not grow in the district where the moths were taken. I simply tried it because I had it growing in my garden. My stock of this plant failing, Mr. W. H. Grigg, of Bristol, kindly sent me a weekly supply of it by post, until the middle of October, when flowers could no longer be obtained. By this time about ten of the larvæ had fed up much in advance of the rest of the brood, and almost gave me hope that, provided I could get them food, they might be induced to feed up this year. I pondered as to what food I could procure, when *Crepis virens* suggested itself to me, from the fact of recollecting that a species of *Crepis* was very plentiful in their habitat. *Crepis virens* being a late-flowering plant and common on Blackheath, there was not much difficulty in getting flowers of it to try, and it proved a complete success. Some of these flowers were placed in a glass cylinder, with a few broken pieces of flower-pot, light soil, and moss, which were kept moist, but not wet, having a free drainage. This cylinder was kept in a warm room, and the ten forward larvæ now fed up rapidly; and by the 1st November the first one had spun up. I immediately despatched one of the largest to Mr. Buckler, who has secured three drawings of this long-desired species. I may mention that at first I had tried the coast *Crepis*, but then only the leaves. They did not apparently care for them at all, or in fact for foliage of any kind. Flowers, when withered, appeared to be most to their taste. The full-fed larva may be briefly described, being almost without ornamentation and of an almost uniform warm stone-colour; it is about three-quarters of an inch long, moderately stout for an *Acidalia*, slightly thickest in the middle, and tapering gradually to the head, which is rather flat and small. The dorsal and subdorsal lines are obscurely indicated. When viewed through a glass of low power the dorsal line is seen to be composed of two fine parallel lines of faint grey; the subdorsal lines by a broken and indistinct row of grey dots, most distinct on the 10th, 11th, and 12th segments. The whole dorsal area is seen to be a series of fine transverse wrinkles, which, with a higher power, appear very like the ridges of corduroy, such as used for workmen's trousers. The spiracular line is closely marked by a produced and wrinkled skin-fold,

which towards the head appears almost fringed, and to which portions of the yellow petals, or rather florets, often adhere. The abdomen and claspers are of the same uniform stone-colour, with a faint indication of a double row of dark spots, two or four on each segment. The larva spins a few coarse threads of silk, drawing together portions of food-plant or moss into an open-work cocoon, through which can readily be seen the light brown chrysalis. Naturally these larvæ would hibernate, which the rest of my brood are now doing.—W. H. TUGWELL; 3, Lewisham Road, Greenwich, November 13, 1880.

TREATMENT OF HYBERNATING LARVÆ.—Last year I referred to the ice-house treatment of hibernating larvæ (Entom. xii. 290), and knowing how difficult it is to carry many species that hibernate as young larvæ through the winter, especially amongst the Diurni and Bombyces, the following remarks of Mr. W. H. Edwards may possibly be instructive. They appeared in the 'Canadian Entomologist' for August, 1880 (vol. xii., p. 143):—"In 'Can. Ent.,' vi., p. 121 (1874), I gave a general account of breeding the larvæ of *Argynnis Cybele*, *A. Aphrodite*, and *A. Diana*. Since that date I have bred *A. Cybele* as well as other species of this group, but before 1880 I always lost the larger part of the larvæ during the winter, or they died off at their successive stages, or in chrysalis. I attempted to keep the larvæ after hatching, which occurs in September or October, in a cool room free from dampness, they being placed on stems of violets growing in pots. But the alternation of warm with cold weather during the fall and winter was unsuitable for the larvæ, the leaves dropped off, or the plants died, and there was a constant loss. After the survivors were brought into a warm room later in the winter they were not healthy, but lingered along, every stage being protracted, many perishing, even up to chrysalis and imago, or the butterflies perhaps came out crippled. In 1873, starting with more than three hundred young larvæ of *A. Diana*, I obtained but a single butterfly. From as many eggs of *A. Cybele* I got three butterflies, and of *A. Aphrodite* one chrysalis only, which died before imago. Encouraged by the results obtained by freezing the larvæ of *Satyrus Alope* in winter of 1878-79, I determined to try the effect of cold on the larvæ of *A. Cybele*, and availing myself of the kindly offered aid of Prof. C. H. Fernald, I sent a considerable number of recently-hatched larvæ to him at Orono, Maine, to be placed in ice-house. They were

in small paper pill-boxes, the unglazed sides of which afforded foothold. I had found that the eggs or larvæ of *S. Alope* escaped mould in such boxes, while others on cloth were destroyed. These little boxes were placed in a flat tin box, which was deposited in the sawdust beneath the ice, 'frozen sawdust,' as Prof. Fernald wrote. Five months later, on 5th March, 1880, I received the boxes by mail. The larvæ were found to be nearly all alive—not more than one or two dead—and when first seen several showed some movement, though only three days from ice. Others were lethargic some hours longer, but by the 6th nearly all had left the boxes and betaken themselves to the plants of violet amid which I had laid them. They crawled up and down the stems, and disposed themselves in the concave sides just as they do in the fall when about to go into lethargy. On 10th March one of the larvæ was found to have passed first moult, several days in advance of any other, and it continued in advance to maturity, passing second moult, 18th; third, 27th; fourth, 4th April; fifth, 12th April; suspended, 23rd; pupated, 24th; and gave imago, *A. Cybele*, female, 14th May. The whole period from ice to butterfly was seventy-three days. The other larvæ passed first moult 19th March; second, 29th March to 2nd April; third, 4th to 6th April; fourth, 11th to 12th; fifth, 16th to 19th April; and the butterflies issued 12th to 27th May. What loss of larvæ there was occurred before first moult, partly by escape, as it seemed, but partly, as I thought, from having been introduced to a warm room too abruptly. But after the moult I lost none. I preserved some examples at every stage in alcohol, and so reduced the number; but there was no death among the larvæ which were allowed to proceed, and I obtained at last seven perfect butterflies, one male, six females. They were also of very large size, equal to any taken in the field. It is evident, therefore, that freezing did not injure the larvæ, but on the contrary, invigorated them, enabling them to pass their successive stages rapidly. [A comparative table is then given of the duration of the various stages in the specimens iced in 1880 and those kept in the cool room in 1873-4. The iced larvæ from removal to imago occupied a total period of from 54 to 87 days, the others 134 days and upwards. The first moult was reached by the frozen larvæ in from 8 to 18 days, while the earliest of the other batch did not change till the 44th day.] I have no doubt that by freezing any species of larvæ which hibernate, they may

successfully be carried to imago—such as *Argynnis*, *Melitæa*, *Colias*, *Apatura*, Satyrids, Hesperians, &c. Probably it would be better not to remove them from the ice until spring has fairly set in, instead of rousing them prematurely, as I did in the case of *A. Cybele*. Comparing the coloration of the butterflies from the iced larvæ with examples taken this season in the field, I see no difference.”—EDWARD A. FITCH.

VANESSA ANTIOPA NEAR CLAVERTON.—I have just had the pleasure of adding to my collection a specimen of *Vanessa Antiopa*, captured on a greengage-tree in the rectory-garden of the adjoining parish of Claverton. The capture was made on the 3rd September, 1880, by the son of the rector, and, owing to his inexperienced handling, the specimen is not so perfect as I could wish.—J. G. ROSS; Bathampton Lodge, Bathampton, near Bath, October 26, 1880.

CHEROCAMPA CELERIO NEAR BIRMINGHAM.—I am pleased to be able to hand you another instance of the capture of *C. celerio*, besides those already recorded in the ‘Entomologist’; it was caught at Edgbaston, near Birmingham, last week. It is a finely marked specimen, though, unfortunately, its upper wings were both torn in capturing it. It passed into the hands of Mr. F. Coburn, taxidermist, of this town.—GEORGE T. BAKER; The Bracken, Augustus Road, November 8, 1880.

ODONESTIS POTATORIA VAR.—I have a variety of *Odonestis potatoria*, the converse of that mentioned by Mr. Jenner Weir at page 207 of this volume. Mine is a male, with the light colour of the female.—R. W. BOWYER; Haileybury, Hertford.

CATOCALA FRAXINI NEAR RUGBY.—It may interest some of your readers to hear of the capture here of a fine specimen of *Catocala fraxini*. I took it on the night of 31st August, when sugaring. I do not hear of one being previously taken in this neighbourhood.—T. W. WRATISLAW; Rugby, Sept. 25, 1880.

LITHOSIA QUADRA IN DORSETSHIRE.—A specimen of *Lithosia quadra* was taken in July by C. F. Benthall at Sherborne, in Dorsetshire; I forget the exact date. He observed a strange-looking wasp flying near his garden, and, on capturing it, found that it was carrying a half-eaten specimen of this moth in its mouth, two of the wings having been torn off. This is the first time *L. quadra* has been seen near Sherborne.—CHAS. E. INCE; 29, St. Stephen's Avenue, Shepherd's Bush, W., Nov. 8, 1880.

EPIONE VESPERTARIA AT ARUNDEL.—On August 29th of last year (1879) I captured a specimen of this insect at Arundel. I see that in the 'Insect Hunter's Companion,' by the Rev. J. Greene, Brandeston, in Suffolk, is given as a locality. The only localities mentioned by Mr. Stainton are York and Lyndhurst. Both Mr. Fitch and Mr. J. Weir identify it as *Epione vespertaria*. The specimen I captured is an exceedingly small one, not more than half the usual size.—A. SIDNEY OLLIFF; 36, Mornington Road, Regent's Park, W., November 5, 1880.

ABRAXAS GROSSULARIATA DOUBLE-BROODED.—During last May and June I collected about 4000 larvæ of this species, and bred about 3000 perfect specimens from the May-gathered larvæ, whilst nearly all the latter ones were Ichneumonised, or, though they made up, failed to produce imagines. On visiting last week one of the localities where I got about 2000 larvæ early in May, I found two pupæ just made up, and larvæ full-fed. These I brought home, and some have gone into chrysalis, whilst others are about to do so. I am curious to know what the imagos from them will be like, not having ever known this species to be double-brooded before. I note it, and shall be glad to hear if any of our fellow-workers have observed a similar instance.—C. S. GREGSON; Stanley, Liverpool, October 20, 1880.

[At p. 20, vol. xii., of this magazine, Mr. Silcock relates a similar instance in November, 1879; but we have not heard that the pupæ produced abnormal forms. Perhaps Mr. Silcock will communicate the result of those pupæ.—ED.]

PÆDISCA SORDIDANA.—On the 26th of September Mr. G. Jackson and myself went to Bishop's Wood, Cawood, to look for larvæ of *Eupithecia trisignata* and *E. albipunctata*, and, having worked very hard for three hours with no success, we turned our attention to beating alder, larch, nut, &c. We soon began to find a Tortrix rather commonly, which I at first took for worn *P. solandriana*, but thought them very late. However, upon a more close examination, I found it was not that species, but the true *P. sordidana* = *Stabilana* of Stainton's Manual. I feel quite sure that an error is often made by persons mistaking this species for *P. semifusca*, but any one who has bred the latter species will at once see that the posterior wings are much lighter and more glossy than in *P. sordidana*. I went again on the 30th, and got a long series, but I was about ten days too late for really fine

specimens. I have not the least doubt the larva feeds on alder, for, although we beat other trees in the vicinity as long as we could, we only got them from the alder trees. *P. semifuscana* feeds abundantly on the *Myrica Gale* in Askham Bog, and is very variable. The moth appears in July and August. *P. sordidana* is very constant in markings, and varies very little in colour; some are a little more fuscous than others, and the under wings are dark grey. I also beat about thirty specimens of *Pædisca ophthalmicana* from poplar in the same wood at the same time.—W. PREST; 19, Holgate Road, York.

HOMOLOBUS DISCOLOR, *Wesm.*, BRED.—At p. 89 of this volume Dr. Capron recorded the capture of five females of *Homolobus discolor*, beaten from hazel. I had the pleasure of breeding a female in September, 1879, and to-day I have bred two, both females, from *Cabera pusaria* larvæ beaten from alder. This will, I think, throw some light on their having been beaten from hazel, the food also of *C. pusaria*. I was not quite positive from what larva the one I bred last year emerged; hence the reason I did not record it.—G. C. BIGNELL; Stonehouse, Plymouth.

THE MIERS COLLECTION.—The very large and extensive entomological collection made by the late John Miers, F.R.S., has been presented to the Ashmolean Museum at Oxford, and is now being studied and incorporated by Prof. Westwood. This collection is particularly rich in Brazilian insects, and thus becomes peculiarly valuable for the Oxford collection, which was, compared with other regions, poor in the neotropical fauna.—‘Nature,’ November 11, 1880.

ERRATUM.—At page 278, vol. xiii., for *Apatura Iris*, var. *Ilia*, read var. *Iole*.

OBITUARY.

FRANCIS OWEN, M.R.C.S.—We regret to record the death of Mr. Francis Owen, of Sunnyside, Leatherhead, surgeon; well known by many of our readers as a lepidopterist. Mr. Owen unfortunately lost his life while on his professional work on the night of October 21st, by accidentally walking into the canal near Kintbury, Surrey, when he was drowned.—J. T. C.

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